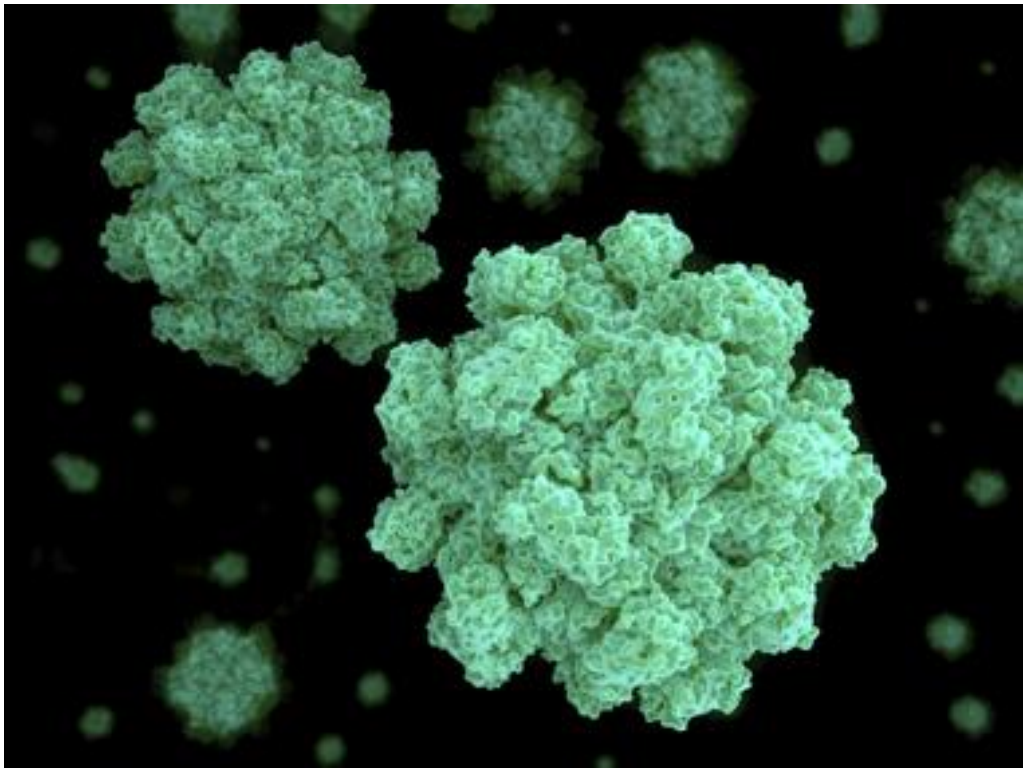
Norovirus…

Many Names, Same Symptoms

Matthew Knight, RN



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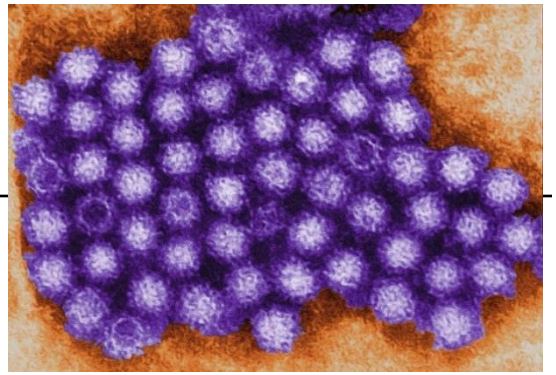
Norovirus key points



- Causes acute gastroenteritis (“AGE”) which then causes dehydration
  - Also referred to as “food poisoning” or “stomach flu”
  - Virus replicates in the small intestine
  - 10-12% seek medical attention
- Responsible for millions of illnesses in the U.S. every year (20 million has been quoted)
- Associated with 2/3rds of all GI illness Outbreaks
- Responsible for almost half of all GI related Hospitalizations
- Highest incidence in Winter months (Nov-Apr)
- Possibly the most infectious virus ever studied

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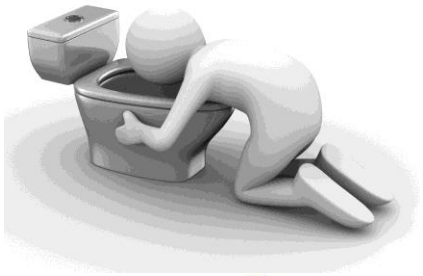
Noro Symptoms

- Incubation period is usually 12-48 hours after exposure (avg. 24 hours)
- Typical symptoms:
  - Acute-onset of vomiting causing dehydration
  - Watery, non-bloody diarrhea with cramps
  - Some may have low grade fever, headaches, and body aches
- Symptoms typically last 24-72 hours
- Meds don't work and no vaccines exist
- Best advice – lay low and hydrate!
- <u>Up to 30% of infections are asymptomatic</u>



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Norovirus – Those most at Risk

- Hardest hit…
  - Infants & children (daycare's, pre-schools)
  - The Elderly (Nursing home residents)
  - Those with compromised immune systems
  - 570-800 Deaths per year (CDC)

- Close proximity + contagiousness = Increased Illness

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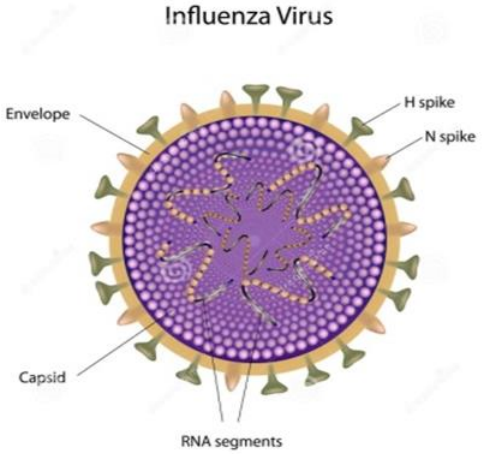
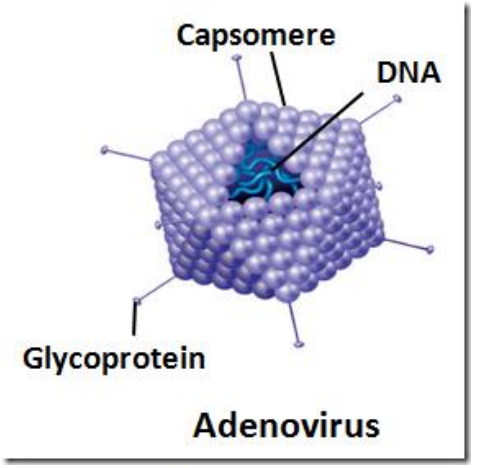
Virus Envelopes

- Enveloped virus (herpes, chickenpox, influenza)
  - Less virulent
  - Sensitive to heat, acids and drying
  - Cannot survive in GI tract
  - Transmitted through blood
- Non-enveloped virus (adenovirus, parvovirus, norovirus)
  - More virulent
  - Resistant to heat, acids and drying
  - Can survive in GI tract
  - Transmitted via fecal/oral, fomites & dust





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Taxonomy/Classification

- Norovirus classified into 6 different Geno-groups (G)
  - G I (**Humans**)
  - G II (**Humans**)
    - 19 different Genotypes
    - **GII.4** responsible for 80% of Norovirus outbreaks for the <u>past decade</u>
  - G III (Bovine)
  - G IV (**Humans and canines**)
  - G V (Mice)
  - G IV (Canines)

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Immunity

- Many different geno-types of Noro
  - Can get infected multiple times
  - Difficult to develop long lasting immunity
- Immunity believed to last 6 months to 2 years
  - Susceptibility may be determined by genes

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Human and Animal Norovirus

- 2012 study in Finland found 4 of 92 dogs in households with recent vomiting and diarrhea had human strains of norovirus.
- Dogs most likely exposed to family members with norovirus – specifically small children
- Proof that dogs are capable of carrying the disease and pass it on to their owners
- Question – does the virus replicate in a dogs intestines or does it simply pass through them?

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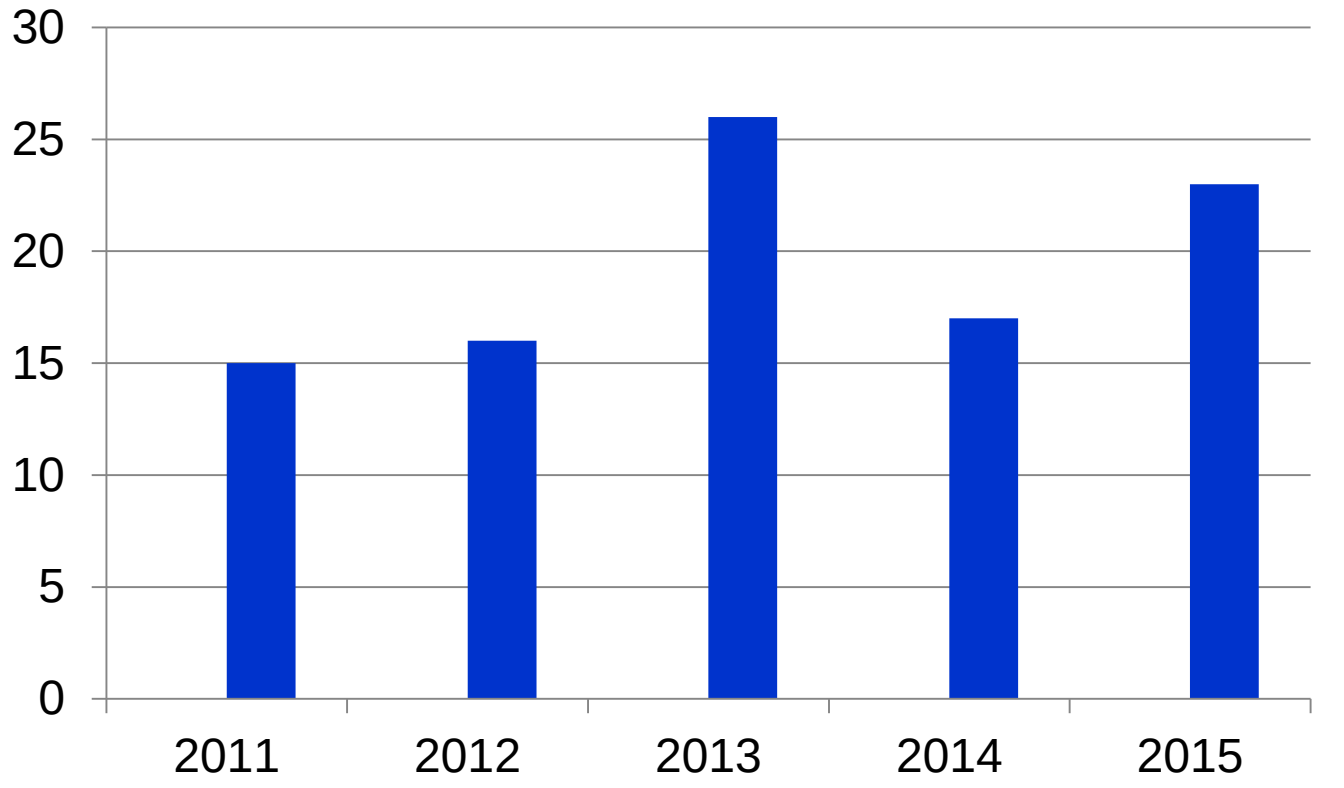
Lake County
"Reported" Norovirus Outbreaks



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Overview

- Infectiousness and Transmission
- Challenges
- Steps to manage an outbreak of “AGE”
- Cleaning and Disinfection
- Current Guidance

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Infectiousness

- Just how infectious is it? - Extremely!!
  - Spreads by droplets of fecal matter or aerosolized vomit
  - Approx. 5 billion infectious doses might be contained in each gram of feces during peak shedding
    - **14.3 grams in a tablespoon**
  - Estimated infectious dose as few as 18-1000 viral particles

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Noro Transmission: 3 Ways

- **#1: Person-to-Person** (75-80%)
  - Fecal-oral route
  - Ingestion of aerosolized vomitus
  - Contaminated surfaces
- **Health Care Workers - high risk**

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Noro Transmission (cont'd)

- **#2: Foodborne** (20%)
  - Infected food handlers or food distribution system
    - Restaurants, caterers and pot lucks
  - Associated with "complex foods"
    - Difficult to know which ingredient is the culprit
  - Meals prepared at home – less risk!

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Noro Transmission (cont'd)

- **#3: Waterborne** (1%)
  - Recreational and drinking water
  - Virus survives in cold water – Can be viable even if frozen
  - Outbreaks in pools are infrequent (or under reported)
    - Guidelines are aimed to prevent bacteria and parasites
    - Norovirus is reportedly resistant to pool level chlorination.
  - Group activities at pools (more people = more risk!)

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Challenges (what makes it tough)

- High viral levels = low infectious dose
- Environmentally stable (survive temps 140 degrees)
- 30% are asymptomatic
- Prolonged shedding (16 days median)
- Lack of lasting immunity
- Multiple modes of transmission
- High morbidity – low mortality
- Simple cleaning doesn’t kill it - resistant to disinfection

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Something's brewing

"I'm feeling sick and getting worse.
I think I'd better see the nurse".

- Increased reports of GI symptoms
- Recognize AGE cluster trigger
  - 4 or more cases in a classroom
  - >10% absenteeism of daily census

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Age Increase Identified

- ***School/Daycare Response***
  - Notify LHD – CD Program
  - Keep a log of absenteeism – those with “AGE”
    - Ill students should be symptom free for 24 hours
  - Work with food service staff
    - Ill food workers symptom free for 48 hours
  - Work with housekeeping on extra cleaning protocols…Do the products we are using work against Norovirus?
  - Communicate with parents
    - Letters
    - Suggest noro testing
  - Back up plan for yourself??

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Acute Gastroenteritis (AGE) Reporting Form

Fax to (847) 984-5680 or call (847) 377-8130

Submit as needed but track absenteeism daily

Trigger - Recognition of an AGE cluster

- ***Four or more cases in a classroom or a group of students OR***
- ***Cases in more than 10% of the school/daycare's census in one day.***

Facility Name:_____ **Date of Report:**_____

Facility Address/Town:_____ **Grades:**_____

 # Students Enrolled:_____ **# Students absent with AGE:**_____

 # Staff (all):_____ **# of Staff absent with AGE:**_____

Onset date of AGE increase:_____ ***Above baseline: Yes / No**

Any gatherings/functions/events prior to onset date:_____

Are meals prepared at your facility: Yes / No / N/A

Are there any ill food workers: Yes / No / N/A If yes, sent home: Yes / No

Are any foods self-serve? (buffet or family style): Yes / No / N/A

Are meals prepared elsewhere (brought in): Yes / No / N/A

If yes, from where (address & town):_____

Predominant symptoms reported:_____

Duration of symptoms (1 day, 2 days, more?):_____

Did anyone see a Health Care Provider: Yes / No / Unk How many:_____

Norovirus (or other) testing ordered: Yes / No / Unk Results:_____

Additional Comments/Notes:_____

Reporting Person:_____ **Phone:**_____

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Age Increase Identified

- ***LHD Response***
  - Current Guidance
  - Report Outbreak to the State using Outbreak Reporting System (ORS)
    - Assigns an outbreak number
  - *Notify Environmental Health Program
    - Kitchen/food worker inspection
    - Restrict ill food workers – test for noro if able.
    - Shall be restricted until symptom free for 48 hours
  - Monitor data (absences, symptoms, duration of outbreak)

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Food Service

- Routine EH Inspection
  - Employee health status
  - Equipment check/malfunctions
  - Hand washing practices
  - Food prep areas
  - Loss of hot water

- Restrict food sharing at school
- How is food served?
  - Self-service food bar?

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Food Service

- Dishwasher vs washing by hand
  - Washing by hand doesn't get the water hot enough to kill Noro
  - Make sure dishwashers are functioning and being used
- Sticky foods on plates (like cheese) helps keep the virus there

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Housekeeping terms

- **Cleaning –** Removes food or soil [illegible]s (soaps, detergents or degreasers)
- **Sanitizing –** Lowers the number of germs on surfaces or objects
  - Heat (Steam, Hot water …170-180 degrees, Hot air…180 degrees
  - Chemicals (chlorine, iodine, ammonium)
- **Disinfecting (or Sterilizing) –**
  - Kills germs on surfaces or objects by using chemicals (usually after a surface has been cleaned)

Cleaning & Disinfection

- For areas exposed to visible/organic debris
  - Immediately clean and disinfect contaminated surfaces
  - Use kitty litter, baking soda or other absorbent materials
  - Use paper towels or disposable cloth (do not vacuum)
  - Careful to not drip or splash
  - More barriers the better – put in plastic bag (sealed) in garbage can

Cleaning & Disinfection

- CDC recommends bleach or Hydrogen peroxide
- Bleach & water - 10% solution
  - 9 parts water, 1 part bleach or (1.5 cups per gallon)
  - Porous surfaces (1 & 2/3rds cup per gallon)
    - Wooden floors or unsealed concrete or stone surfaces
  - Hard Surfaces (1/3 cup per gallon)
    - Vinyl, ceramic tile, sealed counter-tops, sinks, toilets
  - Best results – 10 minute sit time on surface
    - Spray bottle
    - Rinse with clean water (mainly food or mouth contact surfaces)
    - Wipe with clean paper towels
- Never mix bleach solution with other cleaners!

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Cleaning & Disinfection

- Clean safely
  - Gloves – rubber, disposable latex or vinyl
    - Protects you from noro as well as the bleach
  - Protective mask, eye protection
  - Protective clothing (if available)
  - Air out the room (1 hour)
- Clean everything you touch
  - Toilets, floors, doors knobs, counters, light switches, telephones, remotes, etc.
- Wash your hands afterwards

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Cleaning & Disinfection

- Bleach downsides..
  - Bleach loses is potency after 30 days
  - May damage fabrics and other surfaces
  - Irritate eyes, caustic to skin, causes headaches and may cause respiratory problems (asthma)

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Alternatives to Bleach

- U.S. Environmental Protection Agency Office of Pesticide Programs
  - October 29th, 2014……published a list of EPA Registered Hospital Disinfectants Effective Against Norovirus

http://www.epa.gov/oppad001/list_g_norovirus.pdf

- Follow manufacturers recommendations!

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Cleaning & Disinfection

- Carpeted areas - Noro can live in carpet for weeks
  - Remove visible contamination with paper towels or other absorbent material. Discard in a plastic bag to minimize aerosols; seal the bag and put in a garbage can.
  - Steam-clean more effective than wet shampooing (Expensive)
    - 170 degrees for five minutes or
    - 212 degrees for one minute to completely inactivate the virus.
- For surfaces *corrodible or damageable by bleach*: The EPA recommends…
  - Concentrated Lysol® or concentrated Pinesol®),
    - Mixed at two to four times manufacturer's recommended concentration,
    - Best for surfaces that could be damaged by bleach.

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How long will this go on?

- Continuous transmission of AGE
  - Ongoing occurrence of new cases for more than 14 days after first onset
- Average outbreak duration is 11 days for schools
- Considered over if no new cases occur for 2 incubation periods – about a week!

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Is Washing your Hands Enough?

- Quick application of hand sanitizer wont get rid of it
- Most people don’t wash their hands properly
- What is needed to remove virus:
  - 20-30 seconds of vigorous rubbing with hot, soapy water
  - Don’t forget under the nails
- Washing your hands is still important – Main tool in the tool box

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Norovirus

- Current Guidance
  - Memo From IDPH (20 Dec 11):
    - ***Guidance for Prevention of Acute Gastroenteritis (AGE) Outbreaks in Daycare Facilities and Schools***
  - Misc Noro information on resource table

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Thank You!

Questions?

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Lake County Infectious Disease Surveillance and Trends 2015

"What gets measured gets done."
—Anonymous

- Lisa Dallmeyer, RN, BSN, MPH
- Lake County Health Department/Community Health Centers, Communicable Disease Program

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Surveillance Game

Each of you take an M and M candy!

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Surveillance: What is it?

- **Public health surveillance is the ongoing systematic collection, analysis, and interpretation of data, closely integrated with the timely dissemination of these data to those responsible for preventing and controlling disease and injury (Thacker and Berkelman 1988).**
- **Public health surveillance is a tool to estimate the health status and behavior of the populations served…**
- **Because surveillance can directly measure what is going on in the population, it is useful both for measuring the need for interventions and for directly measuring the effects of interventions.**
- **The purpose of surveillance is to empower decision makers to lead and manage more effectively by providing timely, useful evidence.**

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Objective of surveillance

Public health surveillance provides the scientific and factual database essential to informed decision making and appropriate public health action. The key objective of surveillance is to provide information to guide interventions. The public health objectives and actions needed to make successful interventions determine the design and implementation of surveillance systems.

Foege, Hogan, and Newton (1976) state that "the reason for collecting, analyzing, and disseminating information on a disease is to control that disease. Collection and analysis should not be allowed to consume resources if action does not follow." The fundamental principle of public health surveillance is that the surveillance should be designed and implemented to provide valid (true) information to decision makers in a timely manner at the lowest possible cost.

...sacrificing precision makes sense to improve timeliness and save resources that can be used for public health interventions. The utility of surveillance data can be viewed as immediate, annual, and archival, on the basis of the public health actions that can be taken (table 53.1; Thacker and Stroup 1998b).

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Utility of Surveillance Data

Immediate detection of (Immediate)	**Epidemics**
	Newly emerging health problems
	Changes in health practices
	Changes in antibiotic resistance
	Changes in distribution of population at risk for Disease
Periodic dissemination for (Annual)	**Estimating magnitude of a health problem, including cost**
	Assessing control activities
	Setting research priorities
	Determining risk factors for disease
	Facilitating planning
	Monitoring risk factors
	Monitoring changes in health practices
	Documenting distribution and spread of disease and injury
Stored information for (Archived)	**Describing natural history of diseases**
	Facilitating epidemiologic and laboratory research
	Validating use of preliminary data
	Setting research priorities
	Documenting distribution and spread of disease and injury

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Types of Surveillance

- Indicators
- Active Surveillance
- Passive Surveillance
- Routine Health Information System
- Health Information and Management System
- Categorical Surveillance
- Integrated Surveillance
- Syndromic Surveillance
- Behavioral Risk Factor Surveillance System

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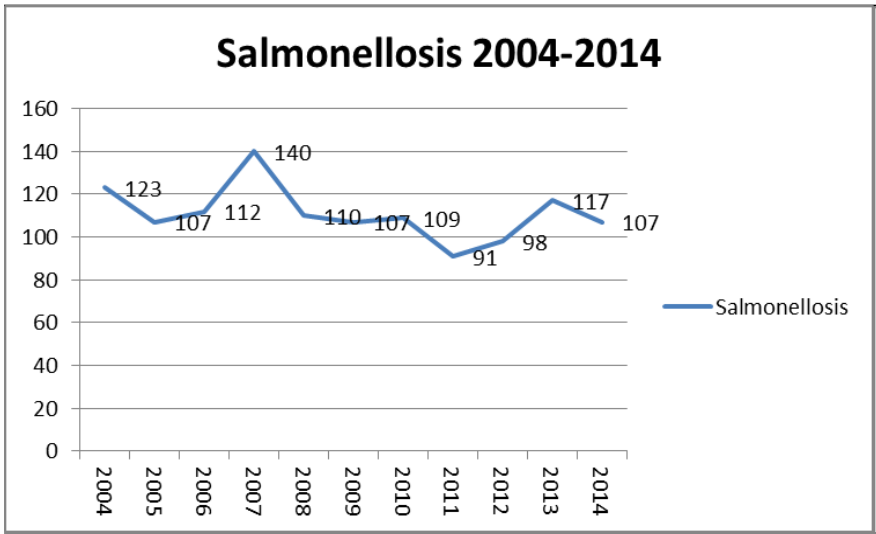
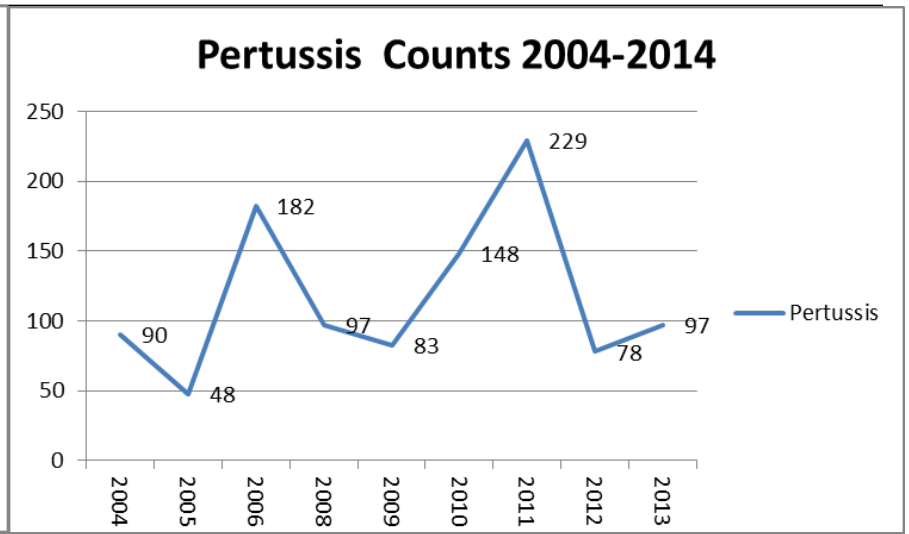
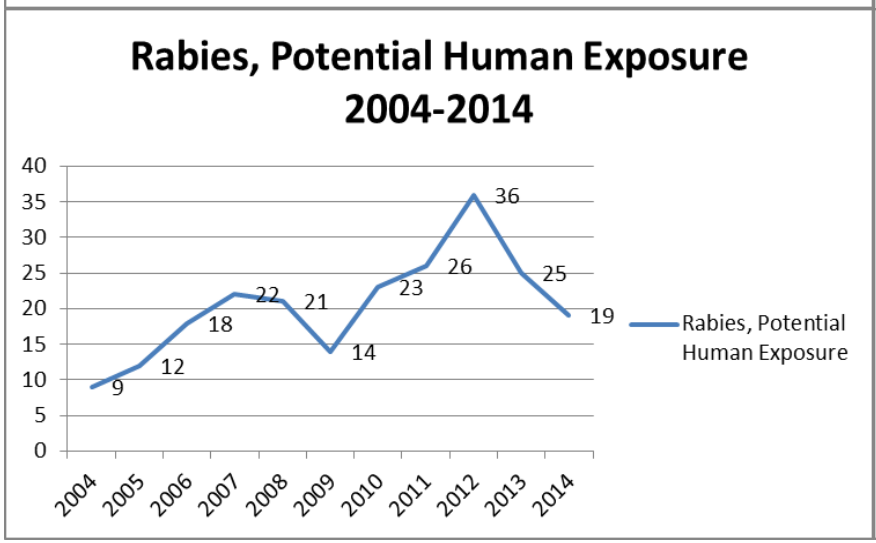
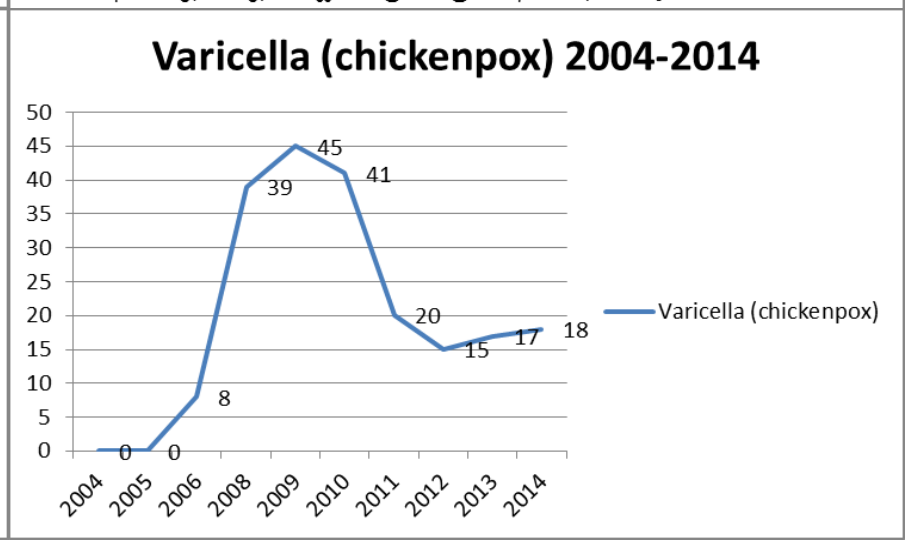
Lake County Trends 2004-2014









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Washington (DC): World Bank; 2006. From:

Source: Adapted from Thacker and Stroup 1998b, 65. Chapter 53, Public Health Surveillance: A Tool for Targeting and Monitoring Interventions

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IMMUNIZATION UPDATE 2015

BY KARYN LYONS
IMMUNIZATION PROGRAM COORDINATOR

IMMUNIZATION SCHEDULES

- Immunization Schedules recommended by the CDC may be found at: http://www.cdc.gov/vaccines/schedules/index.html
- Schedules include:
  - Childhood (0 thru18 year old) routine schedule
  - Childhood catch-up schedule
  - Adult schedule
- ISBE rules summary can be found at http://www.isbe.state.il.us/school_health.htm

ASSESSING IMMUNIZATION REQUIREMENTS

- Proper documentation, *month, day and year,* for each dose is required
- It is not acceptable to get approximate dates because it cannot be adequately determined if the appropriate interval was maintained.
  - Examples of unacceptable vaccine "dates"
    - "Had as infant"
    - "Up to date, lost immunization records"
    - Dates given in years only
    - Dates given in month + year only
- No need to add doses or restart series due to extended intervals – longer intervals do not diminish effectiveness

ASSESSING IMMUNIZATION REQUIREMENTS

- Definitions
  - 1 Month = 4 Weeks / 28 Days
  - 2 Months = 8 Weeks / 56 Days
  - 4 Months = 16 Weeks/112 Days
  - 6 Months = 6 calendar months
    - For Hep B only: 6 months = 24 weeks = 168 days
  - One year of age = On or after the first birthday

THE 4-DAY GRACE PERIOD FAQ

- AAP and CDC accept a 4-day grace period for minimum intervals and ages
- The 4-day Grace Period does NOT apply to the minimum 28-day spacing between live-virus vaccines.
- Illinois does not routinely accept 4-day grace periods
- Provider may write a statement of immunity which is a medical exemption.

COMBINATION VACCINES

- Common combination vaccines found on pediatric immunization records:
  - Pentacel = DTaP + Hib + IPV
  - Pediarix = DTaP + HepB + IPV
  - Comvax = Hib + HepB
  - Kinrix = DTaP + IPV
  - Proquad = MMR + Varicella
- Combination vaccines increases compliance due to the need for fewer injections.
- Watch for errors in timing and spacing. Minimal intervals and ages should be reviewed for all components.

IMMUNIZATION CODE COMPLIANCE

- A child is in compliance with immunization requirement if both of the following apply:
  - All immunizations that a child can medically receive are given prior to entering school.
  - A signed statement from a health care provider is presented indicating when the remaining immunizations will be administered.
- School staff shall assure their completion.
- If child misses a scheduled appointment, he/she is no longer in compliance.

PARENTAL VACCINE OBJECTIONS

- From CDC data: More parents choosing not to vaccinate
  - 1-2% choose no vaccine
  - 10-20% choose to delay, withhold or space out
- 47 states allow religious exemptions. Rules vary.
- Illinois data: The number of religious exemptions in Illinois has more than doubled in 5 years!
  - 5,600 religious exemptions in Illinois in 2009/2010
  - Over 13,000 religious exemptions in Illinois in 2013/2014

RELIGIOUS EXEMPTIONS

- Personal Exemptions are not permitted in IL, but religious objections are easily abused.
- IDPH rule, 77 IL Administrative Code 665.510:
  - General philosophical or moral reluctance to allow an immunization or examination is not sufficient
  - The religious objection may be personal and need not be directed by the tenets of an established religious organization.

RELIGIOUS EXEMPTIONS

- Religious Exemption process until October 15, 2015:
  - Parents should write an original written statement fully describing the religious belief that is the basis for their objection.
  - Local school authority is responsible for determining whether the written statement constitutes a valid religious objection
  - There is no specific legal form or template

RELIGIOUS EXEMPTIONS

- Religious Exemption process beginning October 16, 2015:
  - New Illinois Certificate for Religious Exemption form
  - Parent check which items they are objecting to
  - The parent must state the religious grounds for each of the immunizations or health exams for which they are requesting an exemption
  - The form must be signed by the provider responsible for performing the child's health examination
  - Local school authority is still responsible for determining the validity of the religious objection
  - This form is due in Kindergarten, 6th grade, 9th grade

MEDICAL EXEMPTIONS

- Two kinds of Medical Exemptions
  - Physician Statement of Immunity
  - Medical Objection

MEDICAL EXEMPTIONS

- Physician Statement of Immunity
  - Forward to IDPH for review
  - The student is deemed "unprotected but in compliance" until approved by IDPH

MEDICAL EXEMPTIONS

- Medical Objection
  - Medical objection statements from physicians indicating a medical contraindication are acceptable. Attach to the student's record.
  - The following types of medical objection statements must be forwarded to IDPH for review:
    - Those that do not state that the immunization is medically contraindicated
    - Those that indicate that a medical condition predisposes a student to a health risk if vaccinated
  - If the child's condition changes and immunization is later permitted, the requirements must then be met.

MEDICAL EXEMPTIONS

- After Statement of Immunity or Medical Exemption has been reviewed by IDPH:
  - If accepted, attach the approval letter to the student's health examination form; change the student status to "protected and in compliance"
  - If not approved, forward a copy of the IDPH letter to the student's parent(s), informing them that the required immunizations must be given; change status to "unprotected and in noncompliance"

MEASLES SUSCEPTIBLE LIST

- If the student is not fully vaccinated for measles due to a religious or medical exemption, place the student on the susceptible list.
- Notify the parent(s) of the exclusion policy if there were a measles case in the school.
- In the event that a suspected case of measles is reported in the school, the student would be subject to exclusion from school until 21 days after the onset of the last reported case, or until acceptable proof of immunity is received by the school.

EXCLUSION OF STUDENTS

- State requires exclusion by October 15th
- Many schools have earlier requirements. Earlier exclusion dates should be determined by the local school board.
- Best practice tips:
  - Start reviewing records in the spring or summer before the next school year begins.
  - Send personalized, not generic, letters to parents, as often as needed until they are in compliance.

HOMESCHOOLED CHILDREN

- Health examination and immunization requirements apply to homeschooled children who attend your school for extra-curricular activities, sports, etc.

IMPORTANCE OF VACCINES

- Immunizations protect the health of:
  - The Student
  - The student's family members, including grandparents, infants, and pregnant women who may be at greater risk for illness or complications
  - The broader community, including other students
- Children sometimes carry vaccine preventable illnesses that are minor for them but a major problem for someone else.

TEN GREAT PUBLIC HEALTH ACHIEVEMENTS U.S., 1900-1999

- Vaccination
- Motor-vehicle safety
- Safer workplaces
- Control of infectious diseases
- Decline in deaths from coronary heart disease and stroke
- Safer and healthier foods
- Healthier mothers and babies
- Family planning
- Fluoridation of drinking water
- Recognition of tobacco use as a health hazard

TEN GREAT PUBLIC HEALTH ACHIEVEMENTS U.S., 2000-2010

- Vaccine-Preventable Diseases
- Prevention and Control of Infectious Diseases
- Tobacco Control
- Maternal and Infant Health
- Motor Vehicle Safety
- Cardiovascular Disease Prevention
- Occupational Safety
- Cancer Prevention
- Childhood Lead Poisoning Prevention
- Public Health Preparedness and Response

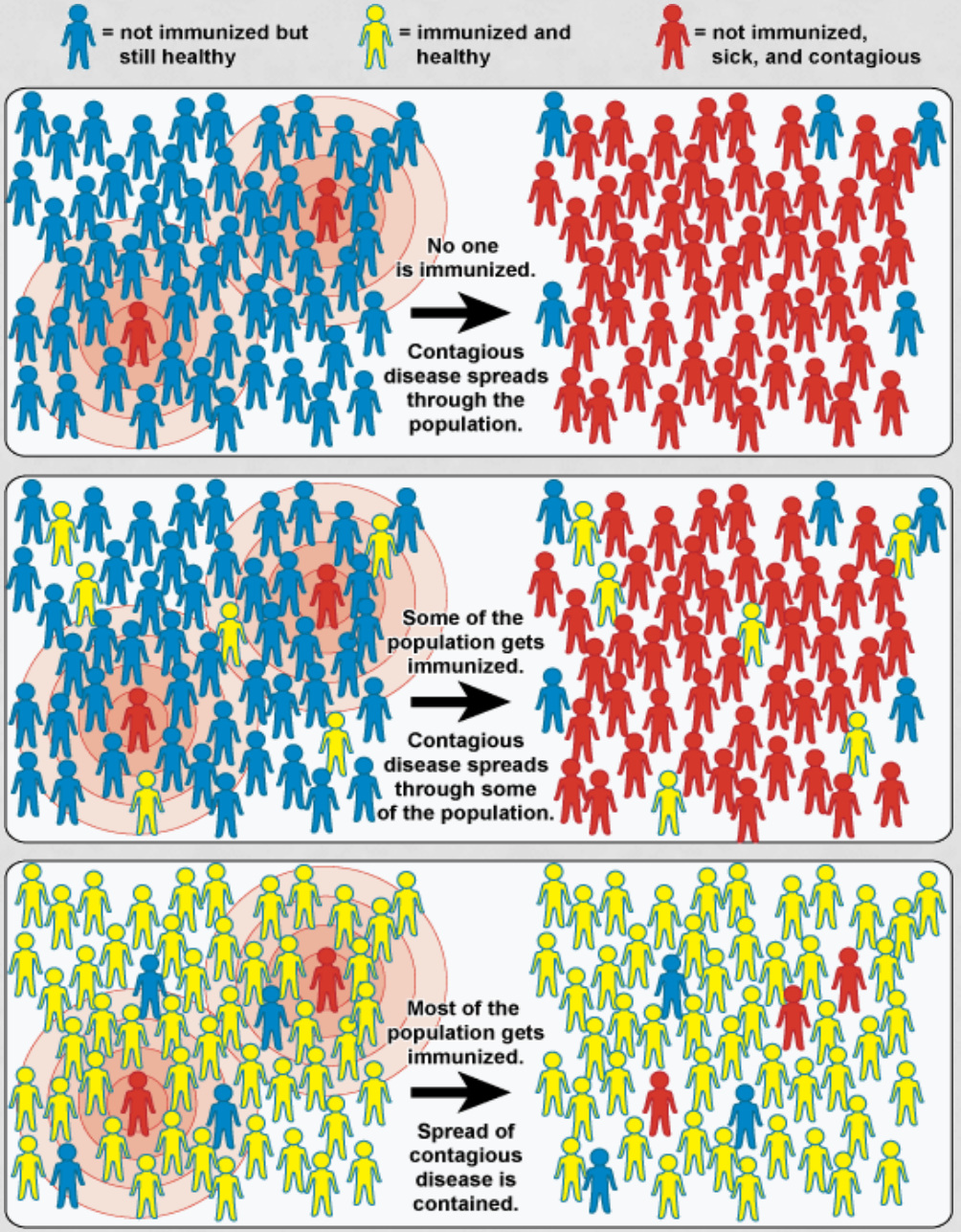
TEN GREAT PUBLIC HEALTH ACHIEVEMENTS WORLDWIDE, 2001-2010

- CDC's Role in Global Health
- Reductions in Child Mortality
- Vaccine-Preventable Diseases
- Access to Safe Water and Sanitation
- Malaria Prevention and Control
- Prevention and Control of HIV/AIDS
- Tuberculosis Control
- Control of Neglected Tropical Disease
- Tobacco Control
- Increased Awareness and Response for Improving Global Road Safety
- Improved Preparedness and Response to Global Health Threats

TARGET VACCINATION RATES

- ISBE recommends that schools reach a 90% rate of compliance to assure the health of the community in which the students live work and play.
- Healthy People 2020 has a 95% target for Kindergarteners for the following vaccines:
  - 4 or more doses of DTaP vaccine
  - 2 or more doses of MMR vaccine
  - 3 or more doses of polio vaccine
  - 3 or more doses of hepatitis B vaccine
  - 2 or more doses of varicella vaccine

COMMUNITY IMMUNITY



RELIGIOUS EXEMPTIONS IN LAKE COUNTY

Religious Exemption Rates in Lake County		
Vaccine	Overall Rate	Worst 10 schools
Measles	0.92%	3.3% to 34.1%
Mumps	0.89%	3.3% to 34.1%
Rubella	0.89%	3.3% to 34.1%
Polio	0.88%	3.0% to 34.1%
DTP	0.86%	3.0% to 34.1%
Varicella	0.85%	3.3% to 34.1%
HepB	0.80%	3.9% to 39.1%
Hib	1.31%	2.5% to 26.1%
Tdap	1.38%	2.4% to 50.0%

OTHER REQUIRED EXAMINATIONS

- Eye examination
  - Due in kindergarten and whenever entering Illinois schools for the first time (except preschoolers)
- Dental examination
  - Due in kindergarten, 2nd grade, and 6th grade
- Physical examination
  - Due in kindergarten or 1st grade (child's first year of school), 6th grade, 9th grade, and prior to entering Illinois schools for the first time

ROUTINE VACCINATIONS FOR CHILDREN

- Pediatric vaccines:
  - DTaP
  - Hepatitis B
  - Hib
  - Polio
  - Pneumococcal
  - Rotavirus
  - MMR
  - Varicella
  - Hepatitis A
  - Influenza

- Adolescent vaccines:
  - Tdap
  - HPV
  - Meningococcal
  - Influenza

- Common Catch-Up Vaccinations for teens
  - Hepatitis B
  - MMR
  - Varicella
  - Hepatitis A

RULES AND RECOMMENDATIONS DTAP (SIMPLIFIED)

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	No minimum listed	2 months (6 weeks min)
	Interval	n/a	n/a
Dose 2	Age	No minimum	4 months
	Interval	4 week minimum	4 weeks
Dose 3	Age	No minimum	6 months
	Interval	4 week minimum	4 weeks
Dose 4	Age	No minimum	15-18 months
	Interval	ISBE: 4 weeks (6 months if given ≥4 years old) Illinois law: 6 months	6 months
Dose 5	Age	4-6 years of age	4-6 years of age
	Interval	6 month minimum	6 month minimum

Both ISBE and CDC: 5th dose is not needed if dose 4 was given at ≥4 years of age and the interval after dose 3 is at least a 6 months.

RULES AND RECOMMENDATIONS POLIO (SIMPLIFIED)

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	No minimum age listed	2 months (6 weeks minimum)
	Interval	n/a	n/a
Dose 2	Age	Not specified	4 months
	Interval	4 week minimum	8 weeks
Dose 3	Age	Not specified	6 – 18 months
	Interval	4 week minimum	8 weeks
Dose 4	Age	On or after 4th birthday	On or after 4th birthday
	Interval	4 weeks minimum	6 months minimum

Both ISBE and CDC: 4th dose is not needed if dose 3 was given at ≥4 years of age and all doses were either IPV or OPV (no combos).
CDC only: Minimum interval for the final dose is 6 months.

RULES AND RECOMMENDATIONS MMR (SIMPLIFIED)

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	12 month (on or after 1st birthday)	12 – 15 months (on or after 1st birthday)
	Interval	n/a	n/a
Dose 2	Age	Not specified	4-6 years is the typical age but may be given earlier in some situations
	Interval	4 week minimum	4 week minimum

- Note: CDC recommends a dose of MMR for a infants 6-11 months of age who travel internationally. This dose must be repeated after 12 months of age. CDC also recommends that the second dose be given at 4-6 years of age, but it may be given earlier (typical reasons: foreign travel, outbreak, etc).
- 2nd dose for mumps and rubella became effective in 2014-15 school year for all grade levels K-12

RULES AND RECOMMENDATIONS HEPATITIS B (SIMPLIFIED)

Requirement applies to Early Childhood and Grades 6-12

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	No minimum age listed	birth
	Interval	n/a	n/a
Dose 2	Age	Not specified	1-2 months of age
	Interval	4 week minimum	4 weeks
Dose 3	Age	Not specified	24 weeks of age
	Interval	8 weeks from dose 2 and 16 weeks from dose 1	8 weeks from dose 2 and 16 weeks from dose 1

Note: Students who receive certain combinations vaccines may have additional doses of Hepatitis B vaccine

RULES AND RECOMMENDATIONS VARICELLA (SIMPLIFIED)

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	12 month (on or after 1st birthday)	12 – 15 months (on or after 1st birthday)
	Interval	n/a	n/a
Dose 2	Age	Not specified	4-6 years is the typical age but may be given earlier in some situations
	Interval	4 week minimum	3 months minimum (a dose administered inadvertently after 4 weeks can be accepted as valid)

VARICELLA VACCINE PROGRESSIVE IMPLEMENTATION OF SECOND DOSE

- A 2nd dose is required in 2015-2016 for students in the following grades: K, 1st, 6th, 7th, 9th, and 10th grades.
- This is a progressive rule, so it will take several years to cover all grades (K-12) with a second dose.
- Progressive rule will apply to the following grade levels:
  - 2014-15 = K, 6, 9
  - **2015-16 = K, 1, 6, 7, 9, 10**
  - 2016-17 = K, 1, 2, 6, 7, 8, 9, 10, 11
  - 2017-18 = K, 1, 2, 3, 6, 7, 8, 9, 10, 11, 12
  - 2018-19 = K, 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12
  - 2018-19 = K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

RULES AND RECOMMENDATIONS TDAP (SIMPLIFIED)

Grades 6-12

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	No minimum age listed but must be given for entry to 6th – 12th grades	11-12 years of age
	Interval	n/a	n/a

- CDC recommendation states that children ages 7–10 years who are not fully immunized against pertussis (i.e., did not complete their DTaP series) should receive a one-time dose of Tdap as part of their catch-up series.
- While not routinely given prior to 11 years of age except in catch-up circumstances, a Tdap vaccine given on or after the 7th birthday would meet the school requirement.

RULES AND RECOMMENDATIONS MENINGOCOCCAL (SIMPLIFIED)

Dose	Age / Interval	School Rules	CDC Recommendations
Dose 1	Age	ISBE rules: 6th grade, minimum 10 years of age. Illinois law: 6th grade, minimum 11 years of age.	11-12 years of age * some high risk patients will need 2 doses in their primary series, in addition to the booster below)
	Interval	n/a	n/a
Booster Dose	Age	ISBE rules: 12th grade, no minimum age listed. Illinois law: 12th grade, minimum 16 years of age.	16 years of age
	Interval	8 week minimum	8 week minimum

Both ISBE and CDC: Booster dose is not needed if 1st dose was administered at ≥16 years of age.

RECOMMENDED BUT NOT SCHOOL-REQUIRED VACCINATIONS

- Hepatitis A – 12 months and up
- HPV – boys and girls 9 years and older
- Rotavirus – for infants under 8 months old
- Flu vaccine – 6 months and older, annually

These vaccines have equally strong recommendations from the Centers for Disease Prevention and Control as the school-required vaccinations.

OTHER PROOF OF IMMUNITY

Vaccine	Lab Evidence of Immunity allowed?	Physician Statement of Disease allowed?
Measles	yes	yes, with physician verification of disease date; cases after 7/1/02 must include lab evidence.
Mumps	yes	yes, with physician verification of disease date. (Note: Illinois law states lab evidence must be included, but ISBE rules do not.)
Rubella	yes	no
Hepatitis B	yes	no
Varicella	yes	yes, with verification of disease history by health care provider.
All others	no	no

IMPROVING VACCINATION RATES

- Strategies that have worked for other schools:
  - Institute exclusion dates well in advance of October 15th to reduce spread of disease and assure that patients need not be reported to ISBE as excluded on October 15th.
  - Provide personalized letters to parents, rather than generalized letters
  - Use multiple methods to deliver message to deliver messages to parents, including robo-calls, person-to-person calls, emails, letters mailed to home, info sent with registration packets or report cards, etc.
  - Avoid sending letters in the back-pack that may inadvertently never reach the parent.
  - Require that needs be met before allowing student to register or before receiving class or teacher assignments
  - Provide incentives or rewards

- Schools can now access immunization records from the State Immunization Registry, I-CARE.
- Allows view and print immunization records.
- Must register for I-CARE by completing the memorandum of agreement, then going on line to sign on through the web portal.
- To register for I-CARE either email dph.icare@illinois.gov or call 800-526-4372

- TIP: VFC providers are now required to enter their immunizations into I-Care

EXAMPLE OF I-CARE VACCINES VIEW

Group	# Vaccine	Lot Number	Date	Status	Reporting Clinic
DTP	1: DTaP	n/a	06/28/2004	OK	GLOBAL - COOK
	2: DTaP	n/a	08/16/2004	OK	GLOBAL - COOK
	3: DTaP	n/a	02/28/2005	OK	GLOBAL - COOK
	4: DTaP	n/a	08/27/2007	OK	GLOBAL - COOK
	5: DTaP	n/a	04/02/2009	OK	PUBLIC AID
HIB	1: Hib, unspecified formulation	n/a	06/28/2004	OK	GLOBAL - COOK
	2: Hib-HBV	n/a	08/16/2004	OK	GLOBAL - COOK
	3: Hib-HBV	n/a	02/28/2005	OK	GLOBAL - COOK
	4: Hib, unspecified formulation	n/a	12/04/2007	OK	PUBLIC AID
	5: Hib, unspecified formulation	n/a	03/07/2008	OK	PUBLIC AID
HAV	1: HAV PED, unspecified formulation	n/a	03/07/2008	OK	PUBLIC AID
	2: HAV PED, unspecified formulation	n/a	04/02/2009	OK	PUBLIC AID
HBV	1: HBV PED/ADOL	n/a	05/24/2004	OK	LAKE CHD HL7 CONTAINER **Prov:** unknown **Vacc:** unknown
	2: HBV PED/ADOL	n/a	06/28/2004	OK	CCDPH-NORTH DISTRICT
	3: Hib-HBV	n/a	08/16/2004	OK	GLOBAL - COOK
	4: Hib-HBV	n/a	02/28/2005	OK	GLOBAL - COOK
HPV	1: n/a		04/07/2015	Overdue	
	shot refused	n/a	08/28/2015	Refused	LAKE CHD IMMUNIZATION PROGRAM **Prov:** unknown **Vacc:** unknown
FLU	1: n/a		09/01/2015	Overdue	
MMR	1: MMR	n/a	08/27/2007	OK	GLOBAL - COOK
	2: MMR	n/a	04/02/2009	OK	PUBLIC AID
MEN	1: Menveo	M15017 [VFC inventory]	08/28/2015	OK	LAKE CHD IMMUNIZATION PROGRAM **Prov:** unknown **Vacc:** unknown

EXAMPLE OF I-CARE IMMUNIZATION REPORT

VALID SHOTS

Group	Shot Date	Shot Date	Shot Date	Shot Date	Shot Date	Shot Date	Shot Date
DTP	06/28/2004	08/16/2004	02/28/2005	08/27/2007	04/02/2009		
HIB	06/28/2004	08/16/2004	02/28/2005	12/04/2007	03/07/2008		
HAV	03/07/2008	04/02/2009					
HBV	05/24/2004	06/28/2004	08/16/2004	02/28/2005			
MMR	08/27/2007	04/02/2009					
MEN	08/28/2015						
PNE	06/28/2004	08/16/2004	02/28/2005	12/04/2007			
POL	06/28/2004	08/16/2004	02/28/2005	04/02/2009			
Td/Tdap	08/28/2015*						
VAR	08/27/2007	08/28/2015					

** Indicates Tdap was given*

SHOTS OVERDUE

Forecast Date	Vaccine Group
04/07/2015	Human Papilloma
09/01/2015	Influenza

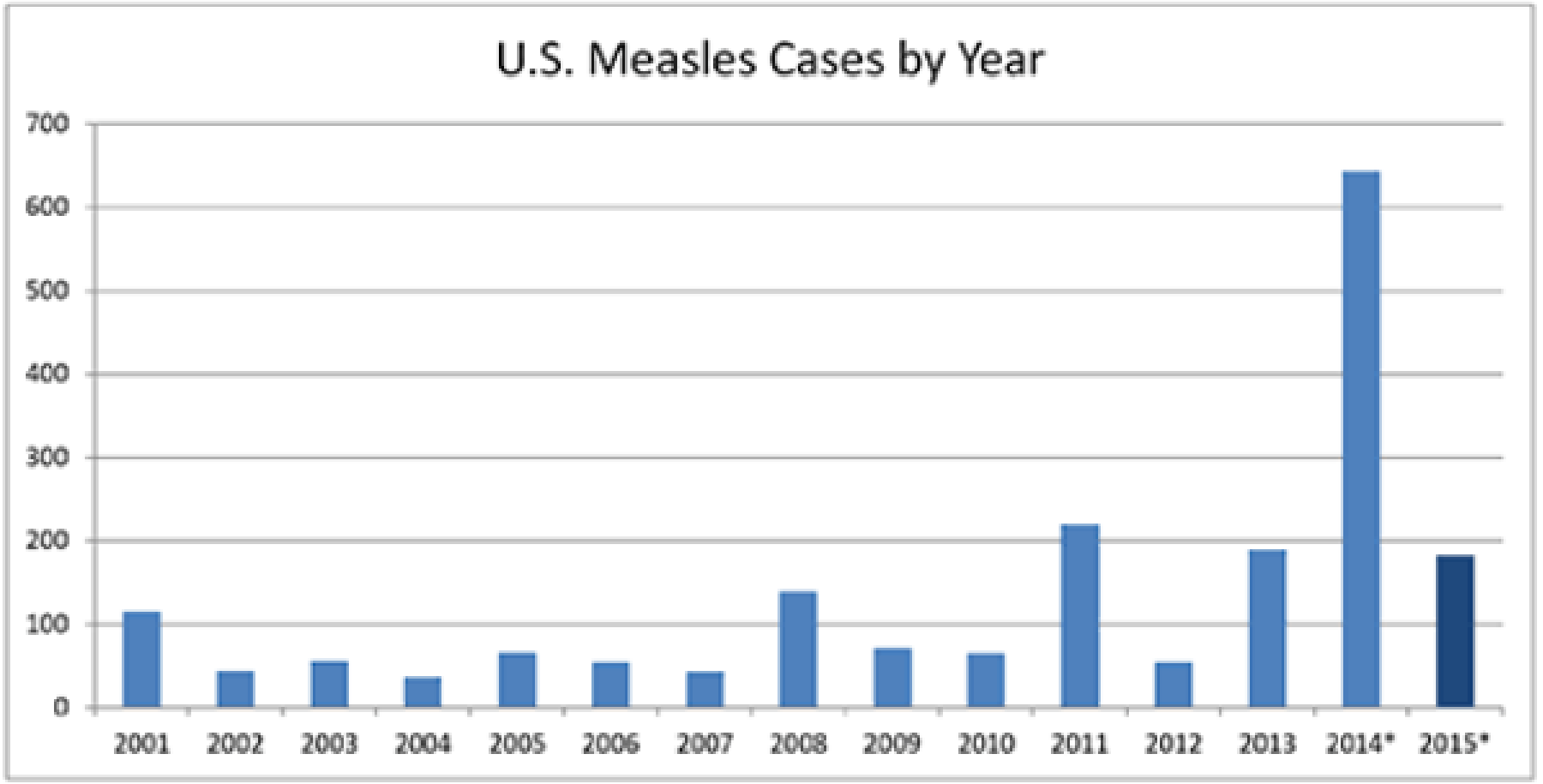
SHOTS DUE LATER

Forecast Date	Vaccine Group
04/07/2020	Meningococcal Disease
08/28/2025	Td

INVALID SHOTS

Group	# Vaccine	Date	Clinic	Mnf Lot	Exp Date
No Invalid Shots					

MEASLES OUTBREAK 2015



*Provisional data reported to CDC's National Center for Immunization and Respiratory Diseases

HISTORY: US MEASLES OUTBREAKS 2000-2010

- In the years 2000 to 2007, the average number of measles cases in the U.S. was 63 cases annually.
- 2008, the U. S. had several large outbreaks.
  - Largest cluster occurred in Illinois and had 31 cases.
  - Index case in IL was an unvaccinated teen who had travelled to Italy. Thirty cases linked to the index case.
  - There were 14 cases in DuPage County, 11 cases in suburban Cook County, and 5 cases in Lake County. Of these, 25 (83%) were home schooled children who had not received measles-containing vaccine.
- In years 2009 and 2010, U.S. measles cases fell back down to baseline levels.

HISTORY: US MEASLES OUTBREAKS 2011-2013

- In 2011, the U.S. had at least 9 outbreaks.
  - Largest cluster occurred in Minnesota in a group in which many parents refused MMR due to safety concerns.
  - One-third of the 21 cases were infants <12 months old.
- In 2013, the U.S. had 11 measles outbreaks.
  - Largest outbreak – 58 cases in NYC. None had record of vaccination, including 12 infants <12 months old and 31 who had opted out due to personal or religious beliefs.
  - Second largest outbreak – 23 cases in North Carolina. Most cases were not vaccinated due to personal beliefs.
  - Third largest outbreak – 20 cases in Texas. All were members of a church whose leader publicly rejected vaccines. Nineteen cases (95%) were <12 months old.

HISTORY: US MEASLES OUTBREAKS 2014-2015

- In 2014, the U.S. had 23 measles outbreaks.
  - U.S. had 668 cases in 27 states.
  - Largest outbreak - 383 cases, primarily in unvaccinated Amish communities in Ohio.
  - Many cases were imported from the Philippines, where an outbreak of over 50,000 cases was occurring.
- So far In 2015, the U.S. has had 5 measles outbreaks, and a total of 188 cases in 24 states and D.C.
  - Largest outbreak – multi-state outbreak with 117 cases linked to Disneyland in California. The virus strain was identical to the one circulating in the Philippines.
  - Outbreak in Illinois involved 15 patients in Cook County.
  - Outbreak in Washington led to first U.S. measles death since 2003. Patient didn't have rash, so measles wasn't discovered until after death. The cause of death was pneumonia due to measles.

MEASLES OUTBREAK IN ILLINOIS 2015

- February 2015 outbreak in Palatine (northwest Cook County) - 15 people were infected with measles
- Not linked to the multi-state Disneyland outbreak
- 1st case: adult diagnosed in late January
- 13 cases associated with a Palatine Kindercare infected in February. Most (12) were infants too young to be vaccinated.
- 1 additional case: adult diagnosed in late February, not linked to Kindercare
- No deaths
- Kindercare changed its employee vaccination policy nationwide as a result of the outbreak

MEASLES OUTBREAK IN ILLINOIS 2015

- One case in Palatine worked at a business in Lake County (Menards in Long Grove)
- Lake County Health Department Communicable Diseases and Immunization Programs:
  - conducted case investigation
  - vaccinated of susceptible employees at Menards
  - offered vaccine to the general public who may have been exposed
- DuPage County offered a press release due to some locations of possible exposure
- One case was student at Elgin Community College in Kane County - susceptible students offered vaccine

MEASLES IN U.S. AND WORLD-WIDE

- In 2000, measles was declared eliminated from the U.S., meaning that endemic transmission of measles has been absent from U.S. for at least 12 months.
- Measles cases and outbreaks still occur in the U.S. due to importation. Large outbreaks were reported in England, France, Germany, India, and the Philippines
- Annually worldwide, about 20 million measles cases and 46,000 deaths will occur.
- Since measles was declared eliminated in 2000, the yearly number of cases in US ranged from 37 to 668.
- The majority of cases have been among people who are not vaccinated against measles.

MEASLES COMPLICATIONS

Complications include:

- 1 out of 10 children will get an ear infection - can result in permanent hearing loss
- 1 out of 4 people require hospitalization
- 1 out of 20 children get pneumonia
- 1 out of 1,000 children will develop encephalitis - often results in convulsions and permanent brain damage
- 1 or 2 out of 1,000 children will die from respiratory and neurologic complications
- Pregnancy - premature or low-birth-weight babies
- Subacute sclerosing panencephalitis (SSPE) – rare but fatal degenerative disease characterized by behavioral and intellectual deterioration and seizures that develop 7 to 10 years after measles infection

MEASLES TRANSMISSION

- Measles is one of the most contagious of all infectious diseases
- About 9 out of 10 susceptible persons with close contact to a measles patient will develop measles
- Transmission: respiratory droplets or airborne spread
- Measles remains infectious in the air for up to two hours after an infected person leaves an area

MEASLES VACCINATION

Measles-containing vaccines:

- MMR – combination Measles, Mumps, and Rubella
- MMRV – combo of MMR with Varicella vaccine
- Single-antigen Measles – no longer available

Effectiveness:

- MMR is 93% effective after dose 1
- MMR is 97% effective after dose 2

Typical Schedule:

- Dose 1 at 12-15 months of age
- Dose 2 at 4-6 years of age
- International travelers of all ages should have 2 doses, and it may be given as early as 6 months
- Health care employees should have 2 doses

MEASLES POST-EXPOSURE PROPHYLAXIS

- Exposed people without evidence of immunity should receive post-exposure prophylaxis (PEP) or be excluded from the setting (school, hospital, etc)
- Health care employees should receive PEP and be excluded from work. Exclude employees from day 5 after first exposure to day 21 after last exposure, regardless of post-exposure vaccine.
- PEP may provide some protection or modify the clinical course of disease.
- MMR vaccine – administer within 72 hours
- Immunoglobulin (IG) – up to 15 mL by weight - administer within six days

MUMPS OUTBREAK 2015

- In early August 2015, the IDPH announced a mumps outbreak among UIUC students.
- At the time of the announcement, there had been 69 cases confirmed since January 2015.
- By September 4, the number of cases was 114 related to UIUC. Total mumps cases in IL are 146.
- Outbreak in 2014 at UIUC - 9 students confirmed
- Outbreak in 2007 at Wheaton College - 93 students
- Outbreak in 2006 at University of Iowa - spread to 3 other Iowa universities and to 13 states – total case count was >5700 people.

MUMPS OUTBREAK 2015

- Most of the UIUC students diagnosed with the mumps had received 2 doses of MMR vaccination.
- In the U.S., outbreaks among populations with high 2-dose MMR coverage found 2 doses of mumps-containing vaccine to be 80%–92% effective in preventing clinical disease.
- Evidence indicates that a third dose of MMR can be helpful in controlling mumps outbreaks in certain settings, including school settings.
- The IDPH recommended that students get a 3rd dose of MMR before returning to campus.
- IDPH allowed health departments to procure vaccine from Section 317 funds for outbreak use.
- 38 students were vaccinated at LCHD prior to return to UIUC in August. It is unknown how many were vaccinated through other venues.

MUMPS DISEASE

- Mumps is an acute viral infection which is usually mild.
- Disease occurs about12-25 days after exposure.
- Characterized by fever & inflammation of salivary glands. One-third of those infected have no symptoms.
- Mumps is contagious for 3 days before and 4 days after the onset of symptoms.
- Spread person-to-person through coughing, sneezing, contact with saliva or nasal and throat discharges.

MUMPS DISEASE

- Mumps disease is generally mild.
- In mild cases the swelling may only last for three days to four days, but it may go on even up to a week or more.
- There is no specific treatment for mumps. Analgesics and regular rinsing of the mouth are recommended to relieve symptoms.
- Complications can occur, including:
  - Inflammation of the testes, ovaries, or breast tissue, and subsequent infertility
  - Spontaneous abortion or intrauterine fetal death
  - Inflammation of the pancreas
  - Hearing loss which can be permanent
  - Meningitis or encephalitis
  - Death
- Complications occur less frequently in the vaccine era. Complications are lower in vaccinated patients.

MENINGOCOCCAL OUTBREAK 2015

- In June 2015, the CDPH identified an outbreak of invasive meningococcal disease among men who have sex with men in Chicago and DuPage County.
- Among the first 5 cases, there was one fatality.
- CDC recommended that MSM in Chicago who have anonymous sex partners, use hook-up apps, or are HIV positive get vaccinated.
- Vaccine was provided at a variety of venues, including at street fests and gay pride parades.
- IDPH provided outbreak vaccine to LCHD STI clinic. Patients are beginning to receive booster doses.

MENINGOCOCCAL TRANSMISSION

- Transmission from person to person occurs through direct contact with nose and throat secretions.
- Some modes of spread include:
  - coughing or sneezing into the face of others
  - kissing a person on the mouth
  - sharing a glass or cup
  - sharing cigarettes or marijuana
  - sexual contact

MENGOCOCCAL MENINGITIS

- Meningococcal Meningitis:
  - In meningitis patients, the protective membranes covering their brain and spinal cord, known as the meninges, become infected and swell.
  - The symptoms include :
    - Sudden onset of fever, headache, and stiff neck (may be difficult to detect in infants)
    - Nausea
    - Vomiting
    - Photophobia (increased sensitivity to light)
    - Altered mental status (confusion)
  - Meningococcal meningitis is very serious and can be fatal in as little as a few hours. Permanent disabilities can include hearing loss and brain damage.

MENINGOCOCCEMIA

- Meningococcemia
  - In meningococcemia patients, bloodstream infection occurs, damaging the walls of the blood vessels & causing bleeding into the skin & organs.
  - Symptoms may include:
    - Fatigue
    - Vomiting or diarrhea
    - Cold hands and feet or cold chills
    - Rapid breathing
    - Severe pain in the muscles, joints, chest or abdomen
    - In the later stages, a dark purple rash
  - Meningococcemia is very serious and can be fatal in as little as a few hours. Permanent disabilities can include amputation of toes, fingers, or limbs or severe scarring as a result of skin grafts.

LCHD IMMUNIZATION PROGRAM

- LCHD Immunization Program information can be found on our website:
- http://health.lakecountyil.gov/Population/Pages/Immunizations.aspx
- The Immunization Program clinic is available by appointment. The phone number is 847-377-8470.
- Children 0 through 18 years of age MUST be eligible for the Federal Vaccine For Children (VFC) program:
  - Medicaid recipient
  - Uninsured
  - American Indian or Alaskan Native
  - Underinsured (evaluated on a case-by-case basis)

REGIONAL IMMUNIZATION PROGRAM CONTACT INFORMATION

WEST CHICAGO REGION

Jan Daniels

245 W. Roosevelt Road

Bldg #5

West Chicago, IL 60185

TEL: 630-293-6800

Fax: 630-293-6908

E-mail: janet.daniels@illinois.gov

TIP FOR THE DAY

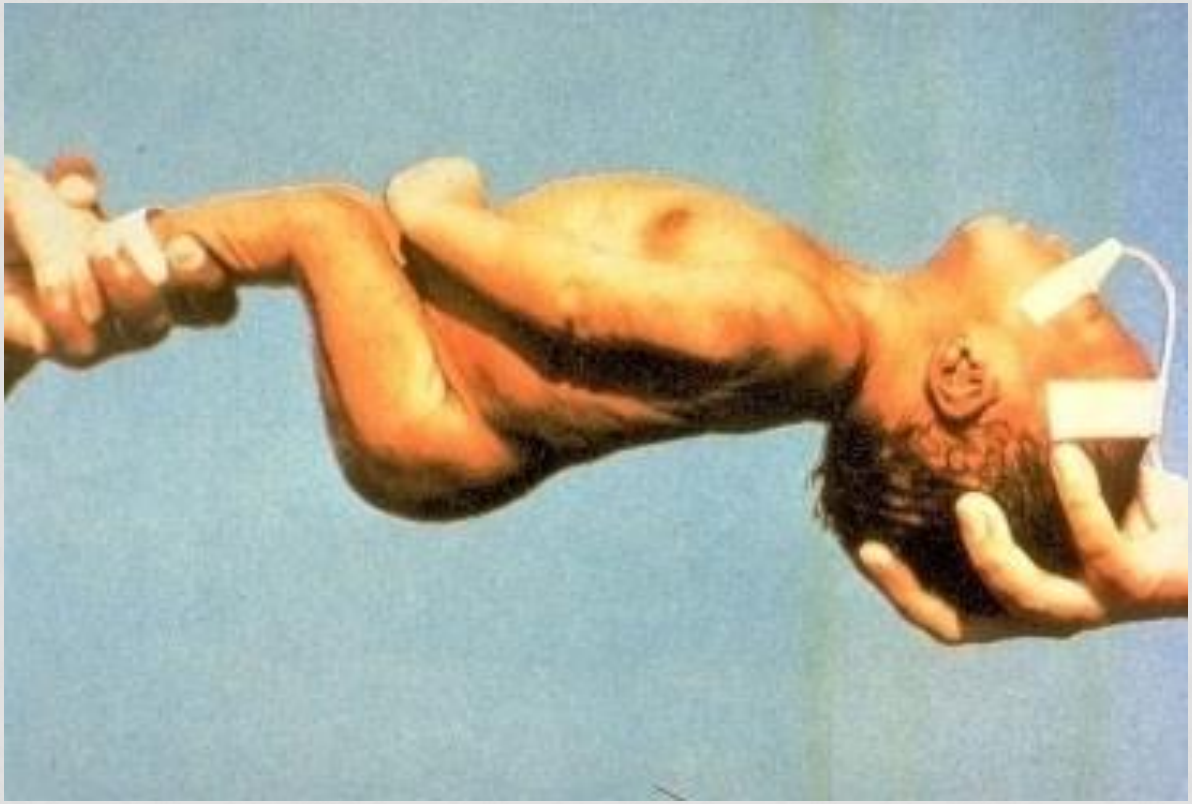
No vaccine is 100% effective

The flipside:

A Vaccine Not Given Is 100% Ineffective

Diphtheria: This is a picture of the throat of a child who has diphtheria. Notice the thick gray coating over the back of the throat. If not treated, this child could die from suffocation.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)



Tetanus: This baby has neonatal tetanus. His body is rigid. Infection can occur when the newly cut umbilical cord is exposed to dirt. Most newborns who get tetanus die.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Tetanus: This person has tetanus. The muscles in his body are in spasm, making it nearly impossible for him to move.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Pertussis: This child has pertussis (whooping cough). He has severe coughing spasms, which are often followed by a “whooping” sound. It is difficult for him to stop coughing and catch his breath.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Pertussis: This child has broken blood vessels in his eyes and bruising on his face because of coughing from pertussis**.**

Photo courtesy of Thomas Schlenker, MD, MPH, Chief Medical Officer, Children's Hospital of Wisconsin

***Haemophilus influenzae* type b:** This girl is hospitalized with *Haemophilus influenzae* type b (Hib) infection shown here involving deep tissue of this girl's face. Hib disease can also lead to brain damage, seizures, paralysis, hearing loss, and death.

Photo courtesy of the Children's Immunization Project, Saint Paul, Minn.

Hepatitis A: Hepatitis A infection has caused this man's skin and the whites of his eyes to turn yellow. Other symptoms of hepatitis A can include loss of appetite, abdominal pain, nausea or vomiting, fever, headaches, and dark urine.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Hepatitis B: This woman died from liver cancer four months after she arrived in a refugee resettlement camp in Thailand. The liver cancer was caused by chronic infection with hepatitis B virus.

Photo courtesy of Patricia Walker, M.D., Saint Paul, Minn.

Influenza: This photo shows how the influenza virus can spread through the air when someone coughs.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Measles: Boy with measles.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Mumps: This child's jaw and cheek are swollen from mumps. Mumps can lead to painful swelling of the testicles in males (sometimes causing sterility), deafness, and brain damage.

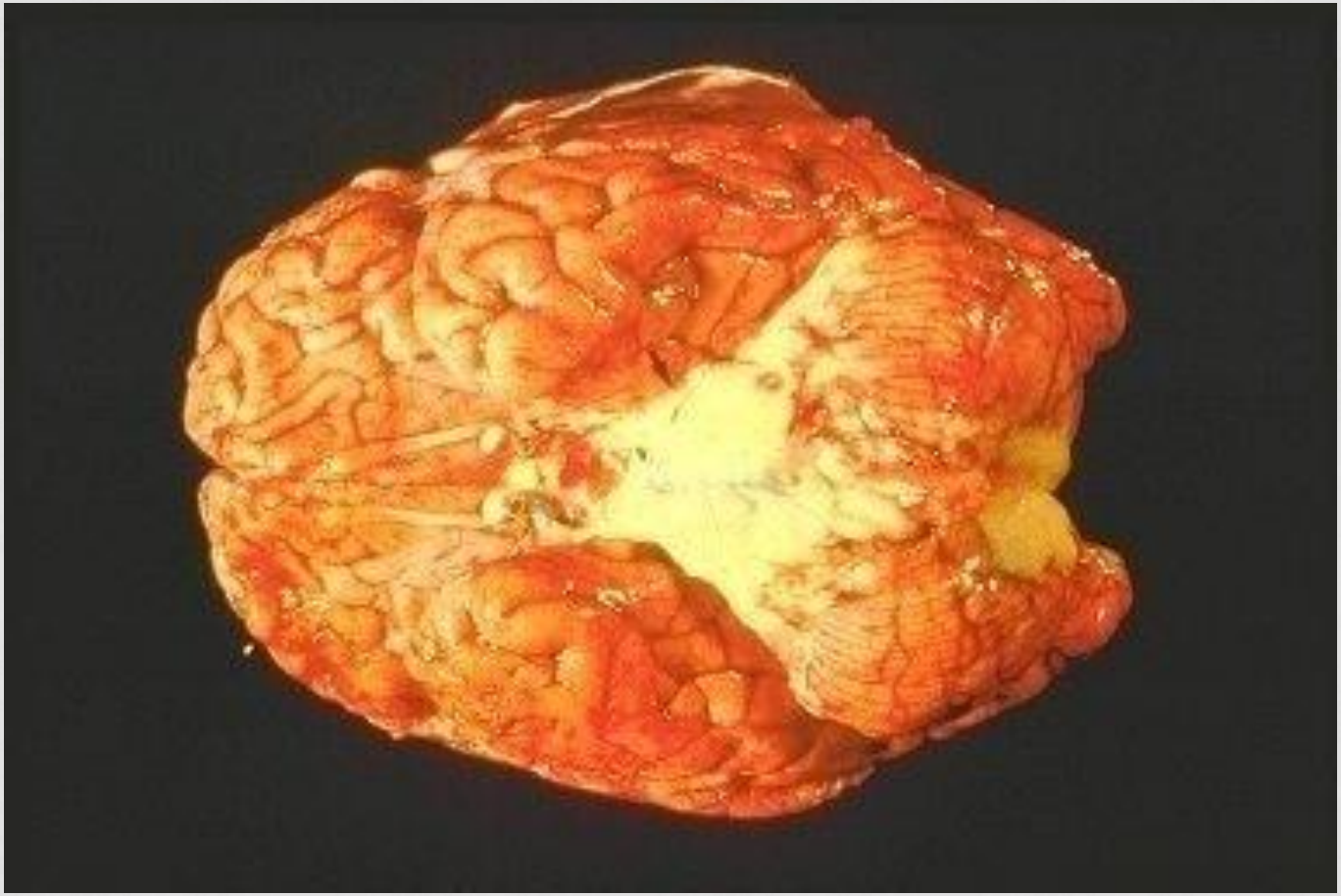
Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Rubella: This teenager has a rash from rubella. The rash is not as prominent as the measles rash and is often missed in diagnosis. Rubella in pregnant women can lead to miscarriage, severe heart defects, and blindness or deafness in their newborns.

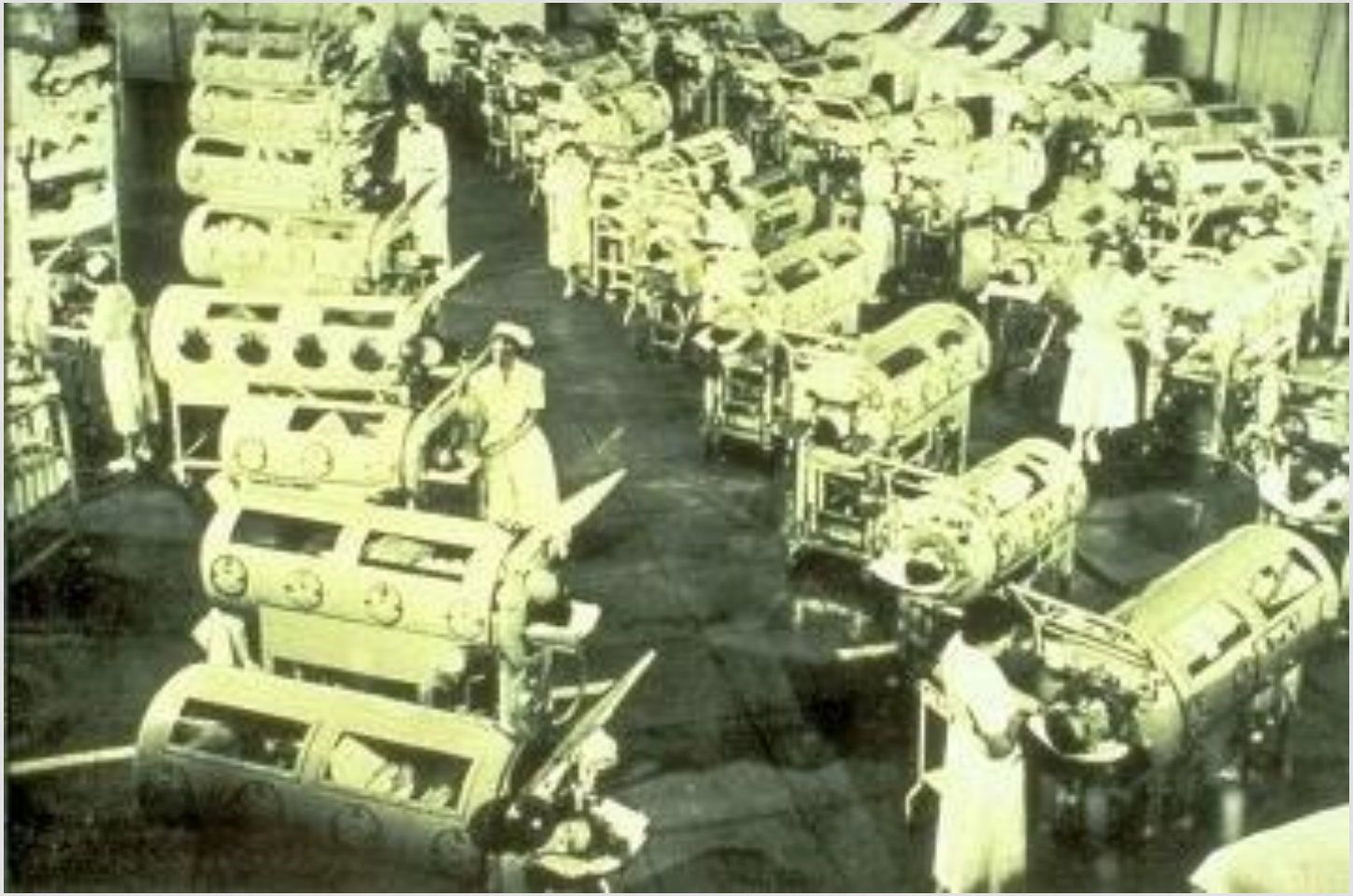
Rubella: This infant was born with rubella. Babies whose mothers were infected with rubella during pregnancy can be born with deafness, blindness, heart damage, and mental retardation.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)



Pneumococcal disease: This is a photo of the brain of a person who died from pneumococcal meningitis. Note the purulence (pus) that covers the brain surface.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)



Polio: This 1952 photo of a Los Angeles hospital respiratory ward shows polio victims in iron lungs — machines which were necessary to help victims breathe.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Polio: This child has a severely deformed leg caused by polio.

Photo courtesy of the World Health Organization (WHO)

Rotavirus: Doctor examining a child dehydrated from rotavirus infection. In developing countries, rotavirus causes approximately 600,000 deaths each year in children younger than age 5 years.

Photo courtesy of World Health Organization, photo credit Dr. D. Mahalanabis

Meningococcal disease: This four-month-old infant has gangrene of her hands and lower extremities as a result of meningococcemia.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

Varicella: This newborn has a secondary bacterial infection, which is a complication following infection with varicella (chickenpox). He contracted chickenpox from his infected mother.

Source: Unknown

Varicella: This photo shows the typical itchy chickenpox rash. There can be 500 sores or more.

Photo courtesy of the Centers for Disease Control and Prevention (CDC)

TUBERCULOSIS (TB)

Dhiya Bakr, RN, MSN
TB Program Coordinator
Lake County Health Department/
Community Health Center

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GOAL AND OBJECTIVES

GOAL: Learn how to do a risk assessment and when to refer an individual to the LCHD/CHC TB Program or primary physician

OBJECTIVES:

1. The participant will be able to describe what TB is and symptoms
2. The participant will be able to list at least three TB risk factors
3. The participant will learn how to do a TB risk assessment.
4. The participant will be able to indicate when to refer an individual to the local health department TB program or primary physician

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TB REVIEW

TB exposure, transmission, infection, and disease

TB signs and symptoms

TB statistics

Target testing

Screening tests

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WHAT IS TUBERCULOSIS?

TB is a bacteria infection that causes illness and if left untreated can be fatal.

Exposure: You breathed the same air as someone with active infectious TB disease

Infection: The TB enters your body and remains dormant. This is Latent TB; not infectious

Disease: The TB enters your body and are actively multiplying and causing disease. Considered infectious if in lungs, larynx or pleural cavity.

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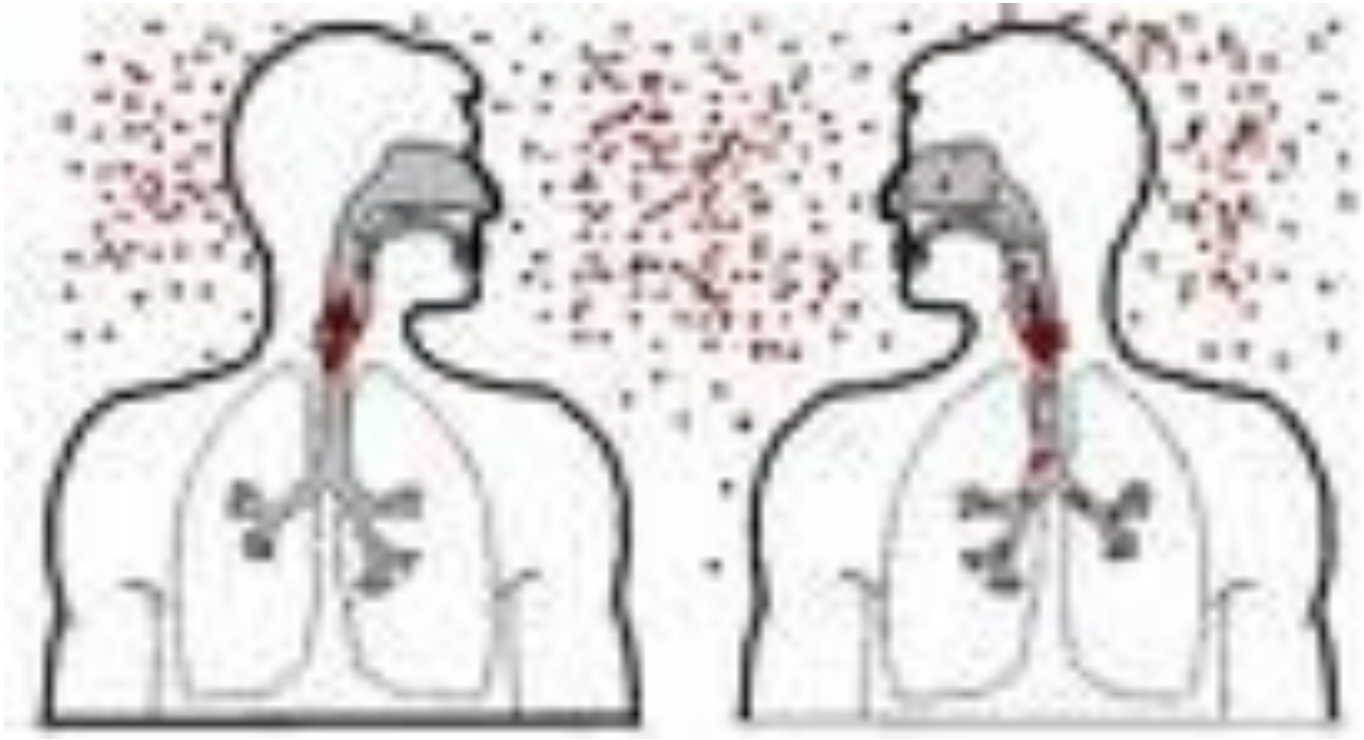
TRANSMISSION

TRANSMISSION



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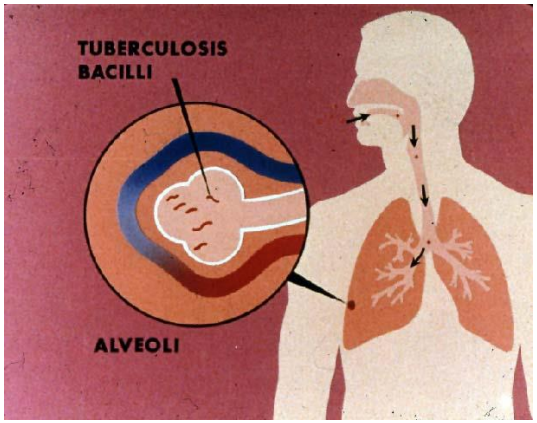
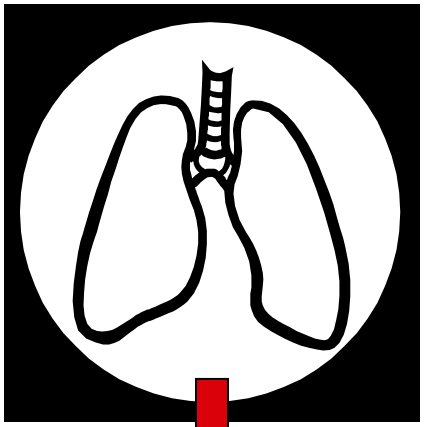
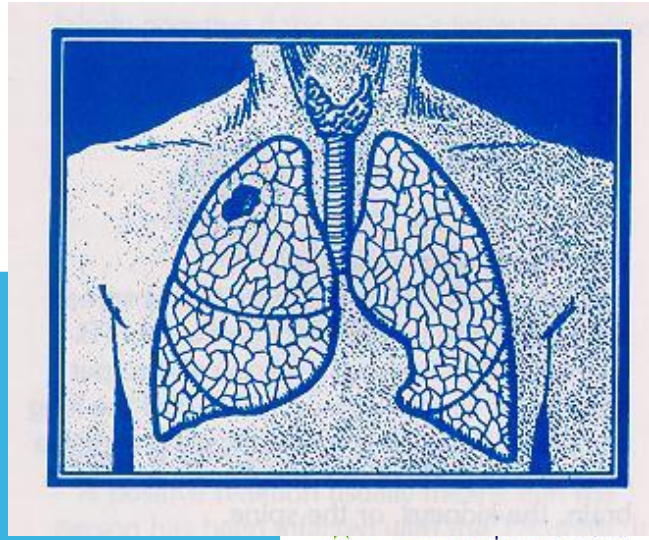
PATHOGENESIS OF TB



Inhalation
and
Implantation

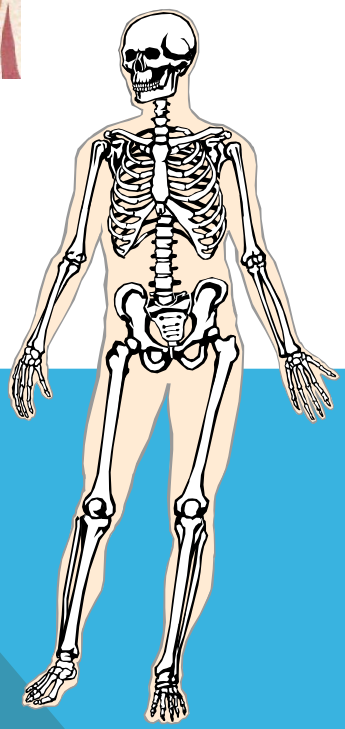
Encapsulation





Disease

Dissemination



TB SIGNS & SYMPTOMS

The individual could have any one or more of the following signs and symptoms:

- Cough greater then 3 weeks (with or without chest pain and coughing up blood)
- Weight loss
- Loss of appetite
- Fever
- Night sweats
- Tired
- Chest pain

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LATENT TB INFECTION: LTBI

- Positive TST 2-10 weeks after exposure
- Asymptomatic
- Normal CXR and physical examination
- Negative AFB smears and cultures
- **NOT** infectious
- Dormant TB bacilli; person at risk for development of TB disease later in life

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ACTIVE TB DISEASE

- Positive TST, but may be falsely negative
- Symptomatic (cough, fever/chills, night sweats, fatigue, loss of appetite, weight loss)
- Abnormal CXR and/or physical examination
- May have positive AFB smears and/or cultures
- **MAY BE INFECTIOUS** until adequately treated

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DATA and STATISTICS

Tuberculosis (TB) is one of the world's deadliest diseases:

One third of the world's population is infected with TB.

In 2013, 9 million people around the world became sick with TB disease.

There were around 1.5 million TB-related deaths worldwide.

TB is a leading killer of people who are HIV infected.

A total of 9,582 TB cases (a rate of 3.0 cases per 100,000 persons) were reported in the United States in 2013.

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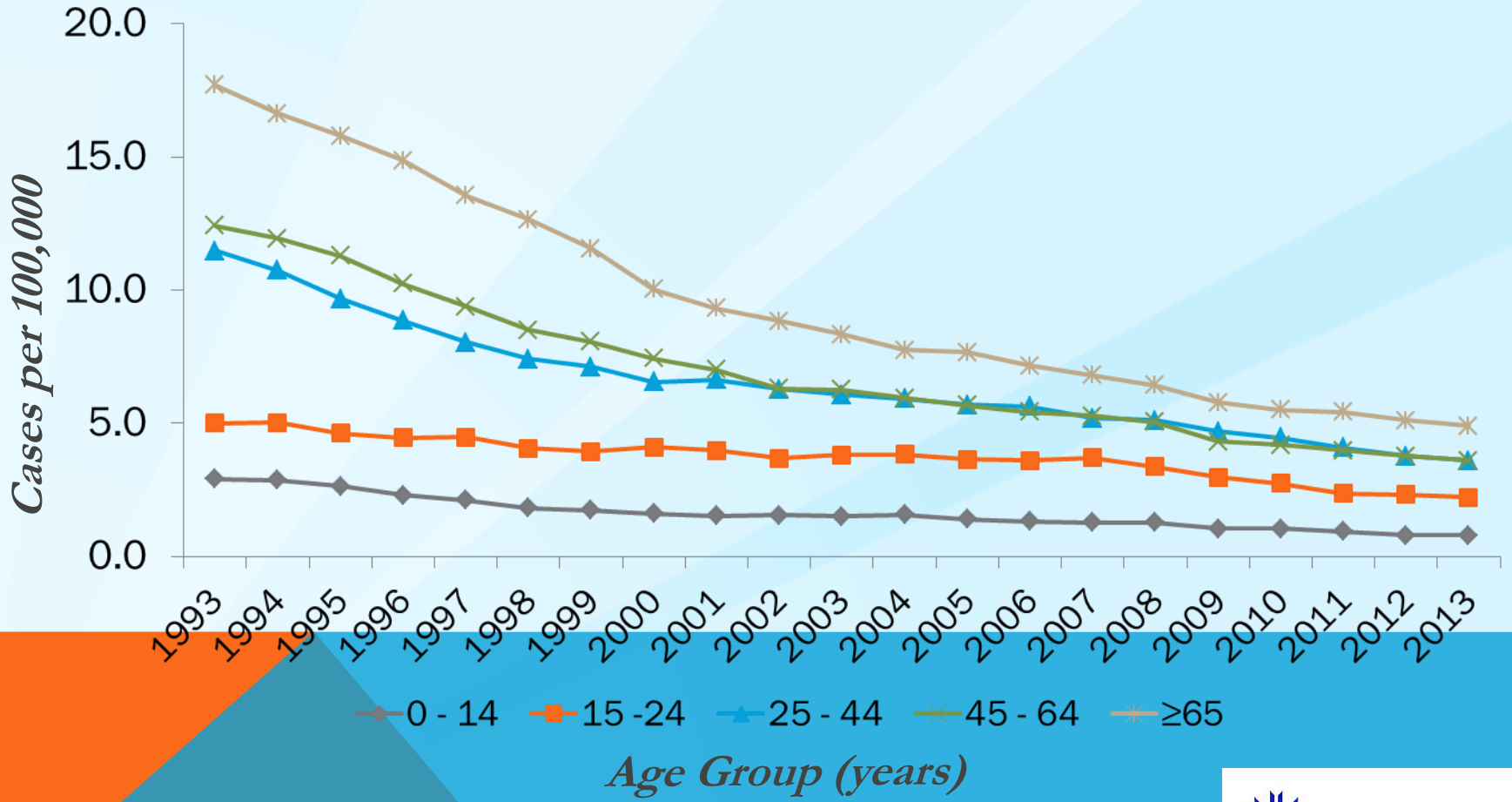
TB CASE RATES* BY AGE GROUP, UNITED STATES, 1993–2013



* Updated as of June 11, 2014.

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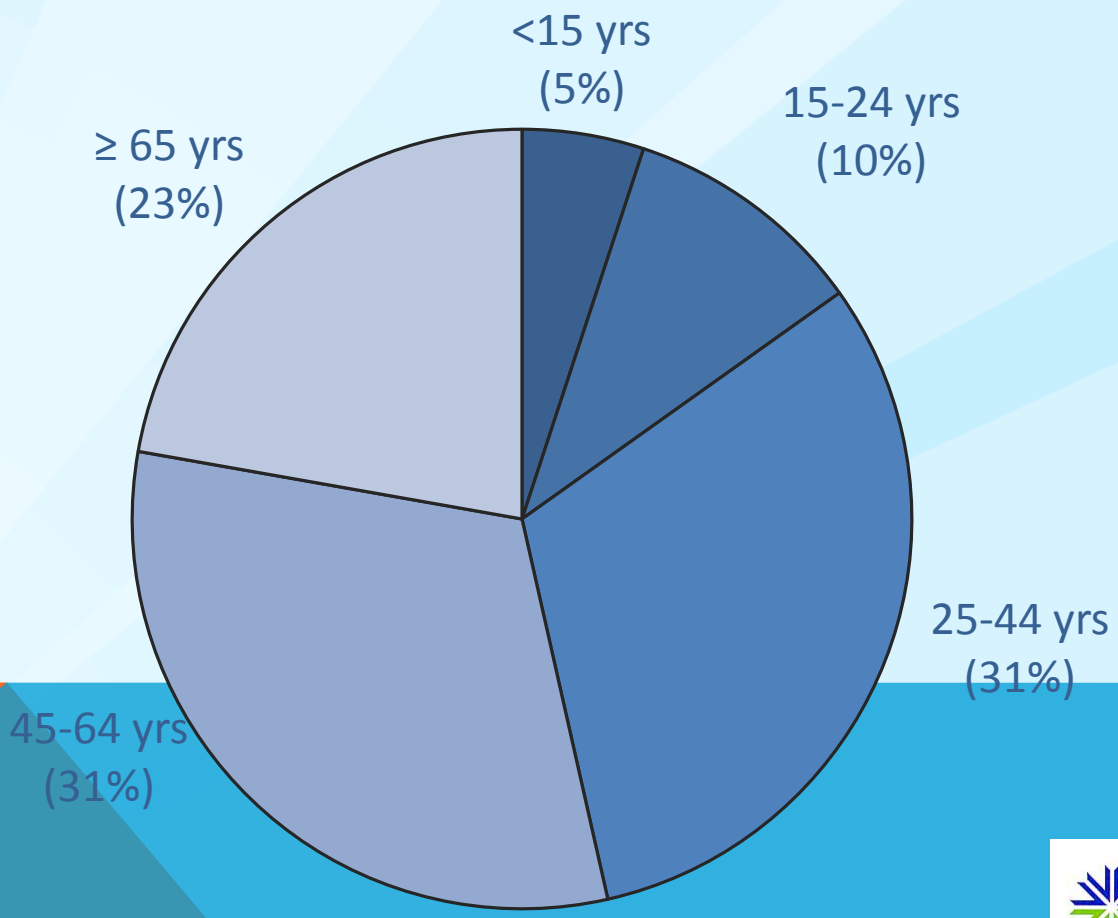
REPORTED TB CASES BY AGE GROUP, UNITED STATES, 2013



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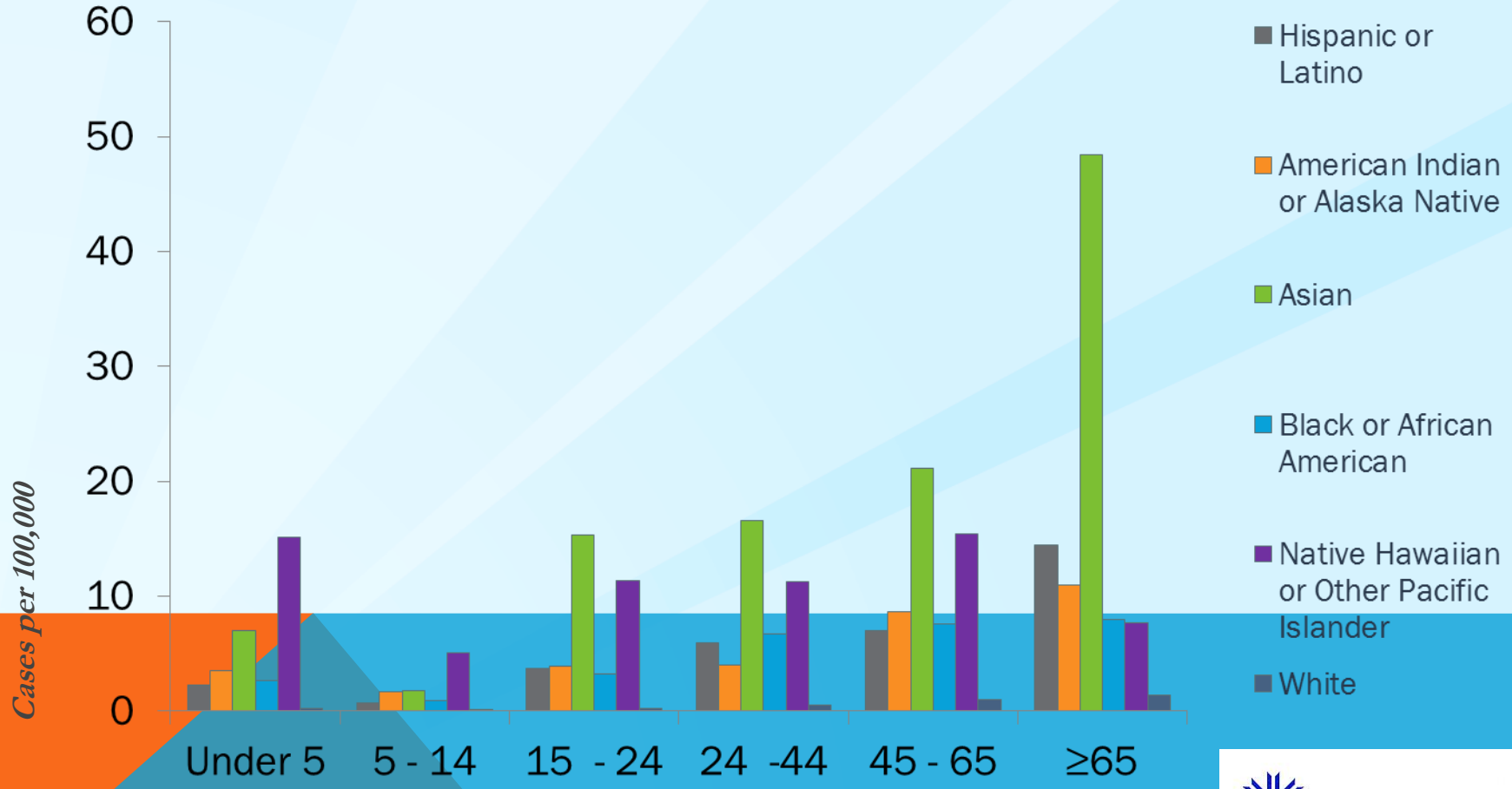
TB CASE RATES BY AGE GROUP AND RACE AND ETHNICITY,*UNITED STATES, 2013



*All races are non-Hispanic. Persons reporting two or more races accounted for less than 1% of all cases.

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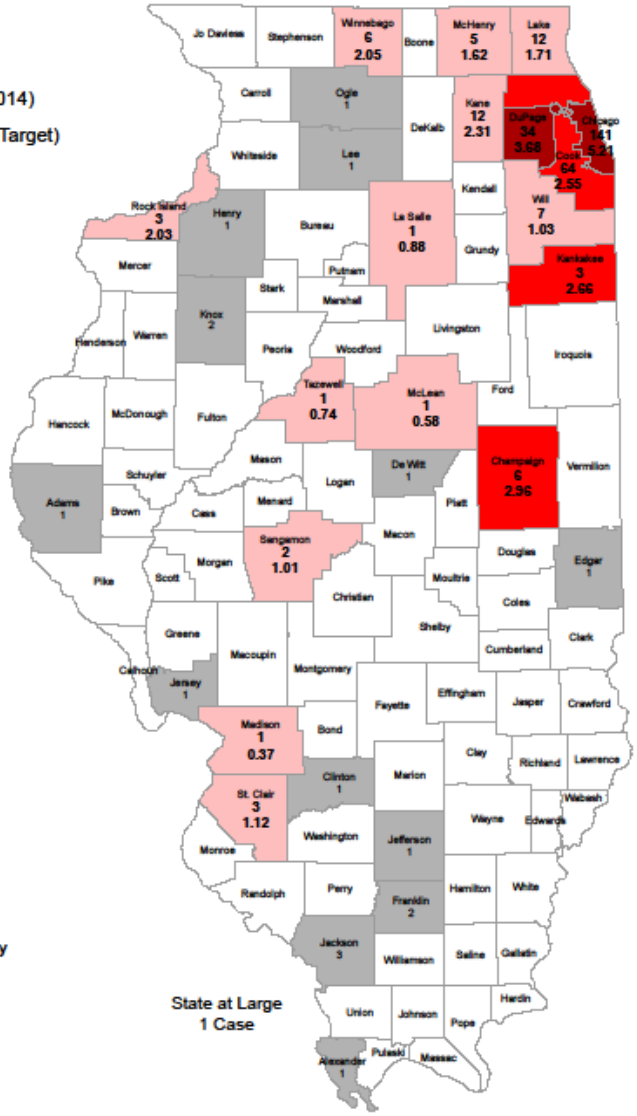
Illinois Tuberculosis Case Rates per 100,000 Population 2014

2014 Rates

- Rate Suppressed
- 0
- <= 2.49 (Illinois Rate 2014)
- 2.50 - 3.50 (Year 2010 Target)
- > 3.50



State at Large
1 Case

United States
Total Cases: 9,412
Rate: 3.0
From: MMWR Vol. 64 No. 10

Illinois (including Chicago)
Total Cases: 320
Population: 12,848,554
Rate: 2.49

Illinois (outside Chicago)
Total Cases: 179
Population: 10,142,453
Rate: 1.76

City of Chicago
Total Cases: 141
Population: 2,706,101
Rate: 5.21

Suburban Cook County
Total Cases: 64
Population: 2,506,271
Rate: 2.55

Illinois (outside Cook County)
Total Cases: 115
Population: 7,636,182
Rate: 1.76

Illinois Population figures from 2013 American Community Survey (5 year), U.S. Census Bureau.

National Rate calculated with population data from the 1 July, 2013 Population Estimates, U.S. Census Bureau.

Rates are suppressed for areas with a population < 100,000.

Illinois case counts as of 19 March, 2015; are still subject to change/review.
National figures are provisional until the complete report is published later in 2014.

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LAKE COUNTY TB STATS

- 36 TB cases reported between 2011 and 2014
- Year to date: 7 cases
- Highest percentage reported in age 45-64 age group for Lake County
  - One case in age group 0-4 years
  - No cases in age group 5-14 years
  - 9 cases in age group 15-24
  - 20 cases in age group 25-44
- 91.7% cases born outside of the USA
- Countries of origin: Africa, Belize, Honduras, India, Asia, Mexico and USA
- Males 56% and females 44%

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THE ROLE OF TARGETED TESTING

Strategies for controlling and preventing TB:

- ✓Identifying and treating persons with TB disease
- ✓Identifying and screening contacts to TB cases
- ✓Screening populations at high risk for LTBI and TB disease

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TARGETED TB TESTING: SCREEN AND TEST INDIVIDUALS AT HIGH-RISK FOR LTBI

Persons who live or stay in overcrowded, poorly-ventilated environments

Substance abusers, particularly IVDU

Recently arrived (< 5 yrs.) immigrants from countries with high TB rates

Persons with compromised immune systems

Persons who live or lived in institutional settings

Persons with inadequate health care

Health care workers or others with frequent contact with any of the above groups

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TARGETED TB TESTING:GROUPS AT HIGH-RISK OF PROGRESSION TO TB

Persons recently infected with *M.tb* (2yrs)

Persons with certain medical conditions

- HIV infection
- Diabetes mellitus
- Silicosis
- Cancer of the head or neck
- Other neoplasms (e.g. lung cancer, lymphoma, leukemia)

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TARGETED TB TESTING:: GROUPS AT HIGH RISK OF PROGRESSION TO TB CONT.

- Prolonged corticosteroid /other immunosuppressive therapies
  - Equivalent of 15 mg of prednisone daily for one month or longer
- Chronic renal failure/hemodialysis
- Organ transplant
- Injection drug use
- Conditions leading to low body weight (10% or more below the ideal) e.g. gastrectomy, intestinal bypass, etc.
- Radiographic findings consistent with prior TB (in a person inadequately treated)
  - Fibrotic lesions, not pleural thickening or isolated calcified granulomas

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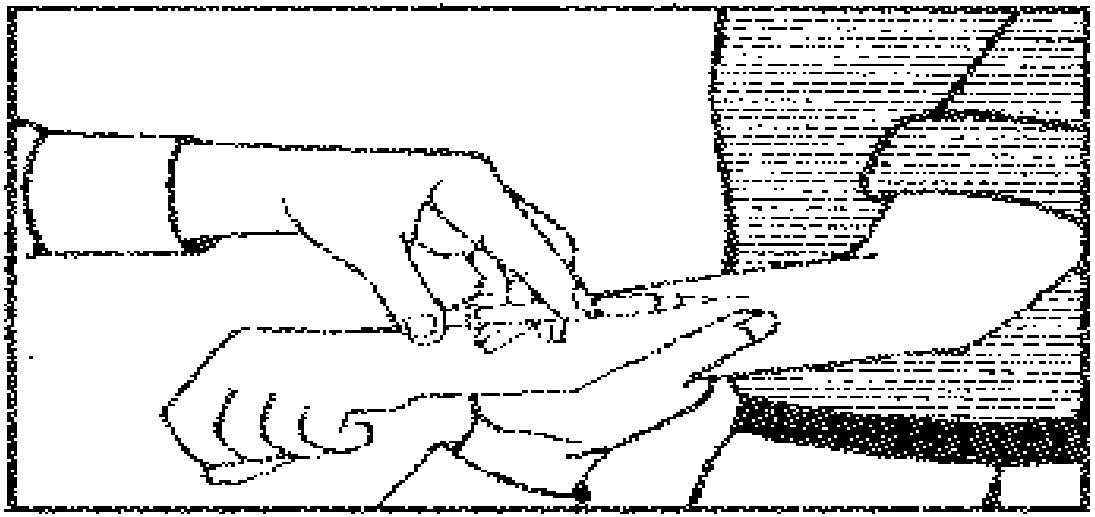
TST: TUBERCULIN SKIN TESTING

- **Mantoux** : TST (Tuberculin skin test). The antigen used is PPD (purified protein derivative).
- **TB blood test:** Quantiferon and T-spot



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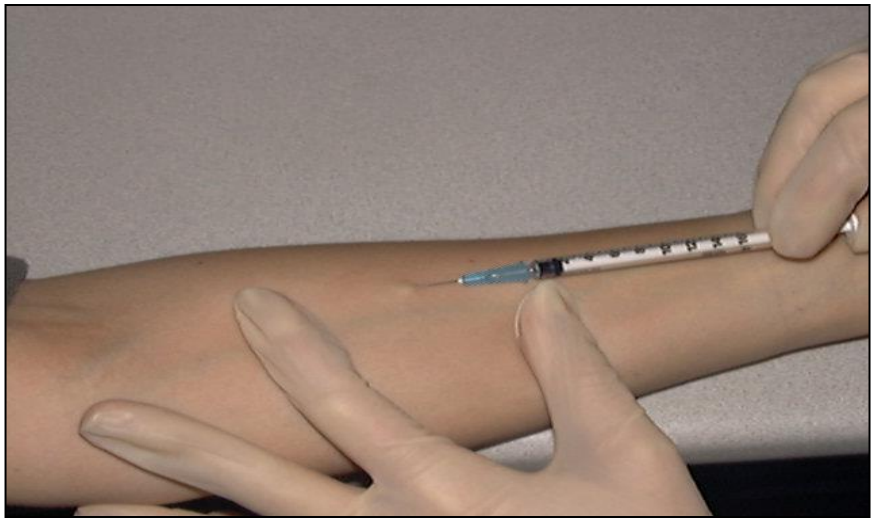
Administering the Tuberculin Skin Test

- Inject intradermally between the layers of skin of (L) forearm
- 0.1 ml of 5 TU PPD tuberculin
- Produce wheal 6 mm to 10 mm in diameter



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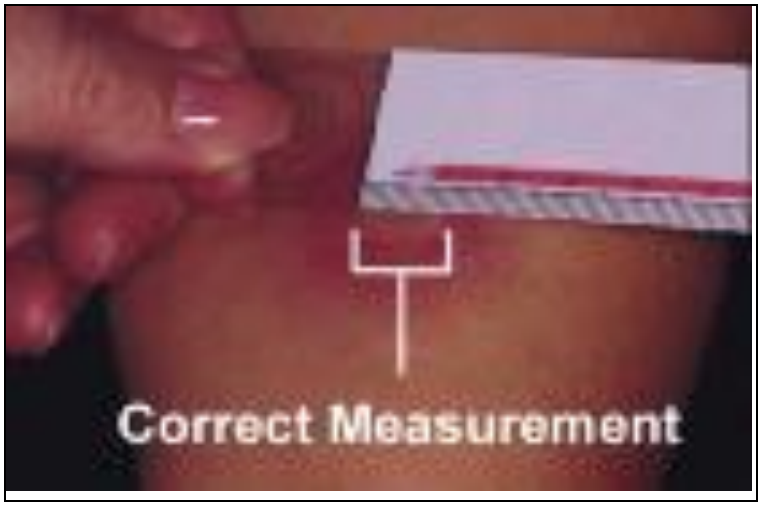
Reading the Tuberculin Skin Test Reaction

- DTH response occurs 2-10 weeks following infection
- Reactions begin in 5-6 hrs; peak in 48-72 hours
- Read reaction 48-72 hours after injection



- Measure induration transversely
- Record result in millimeters (mm)

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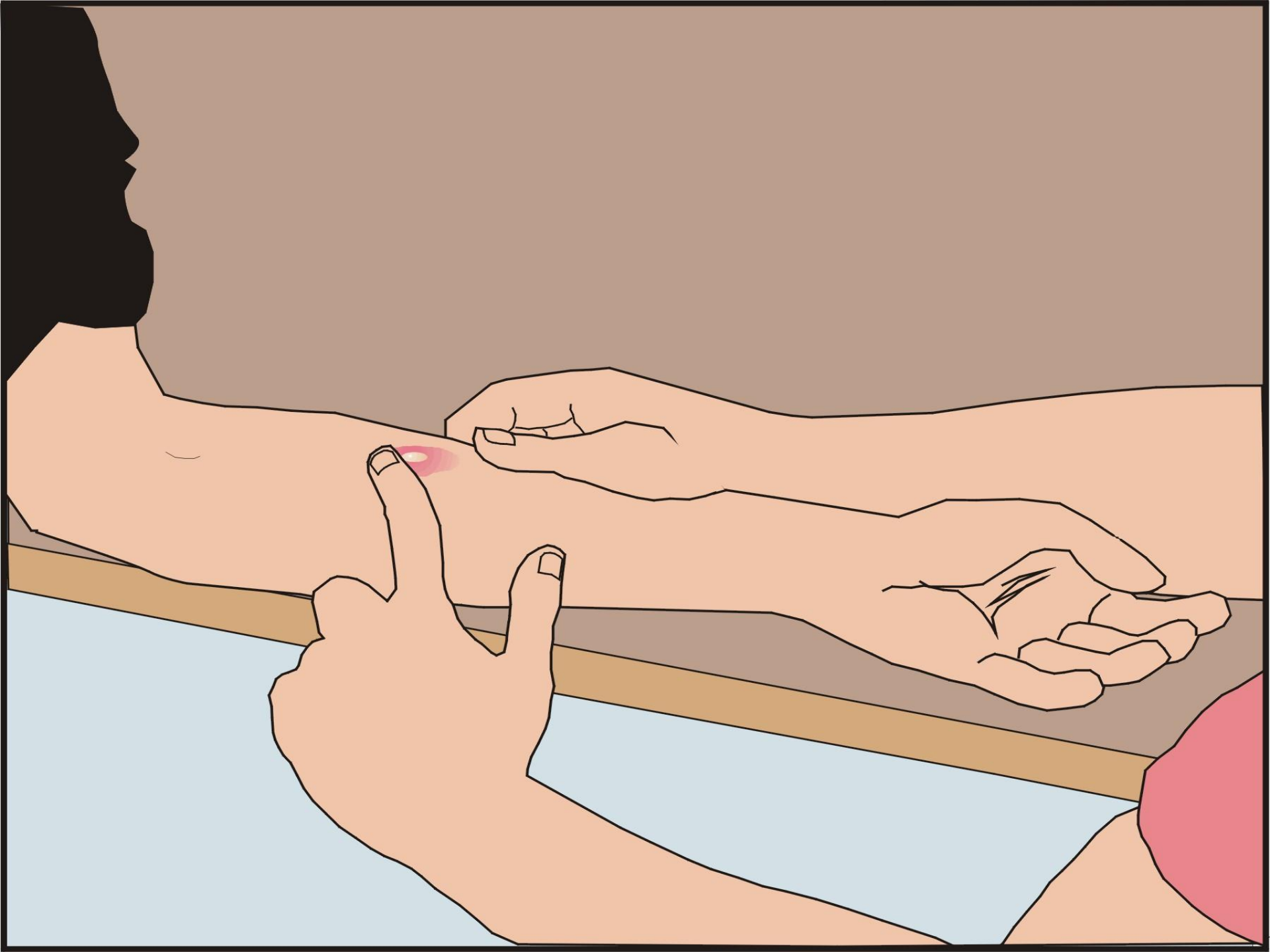

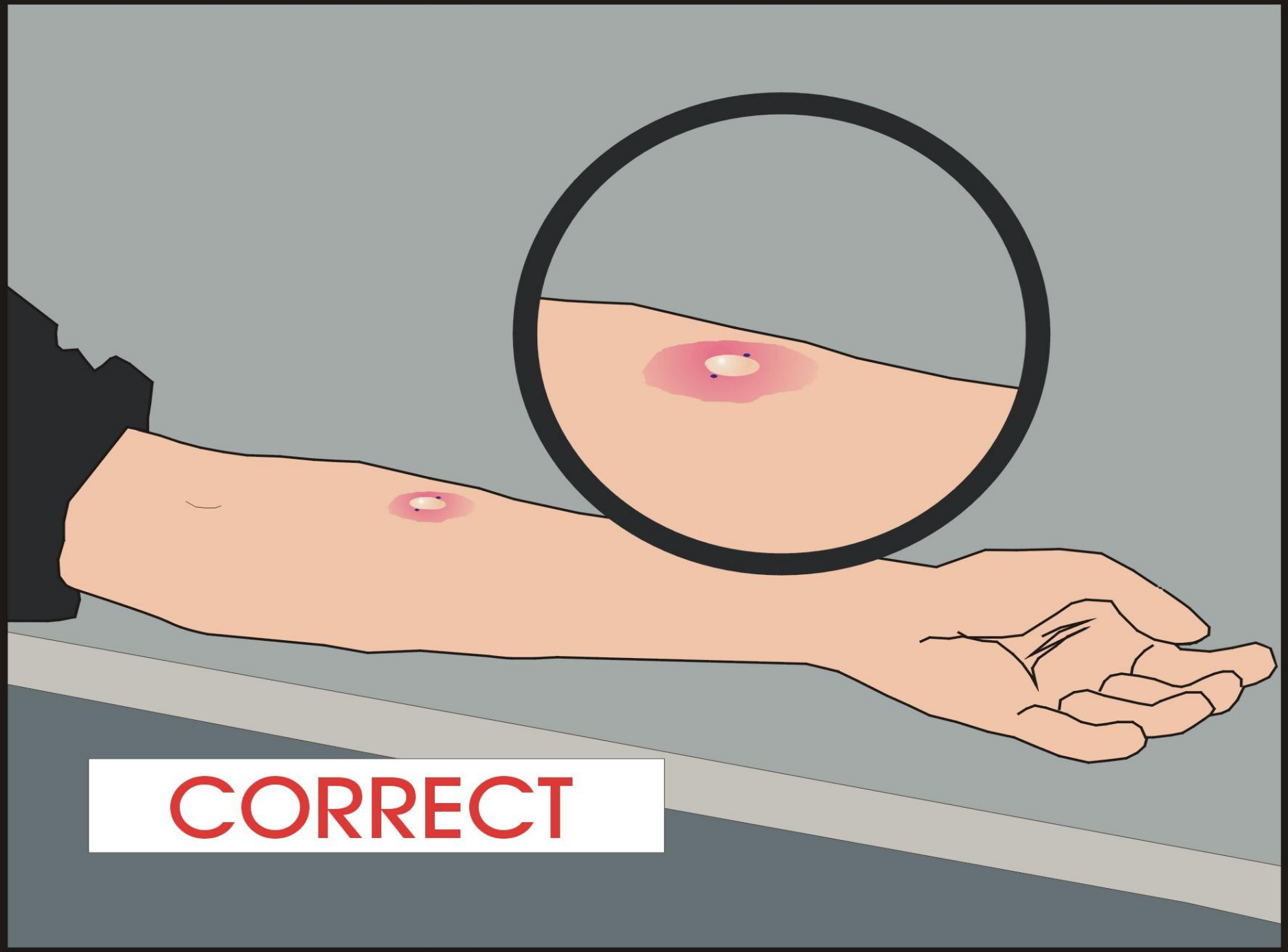
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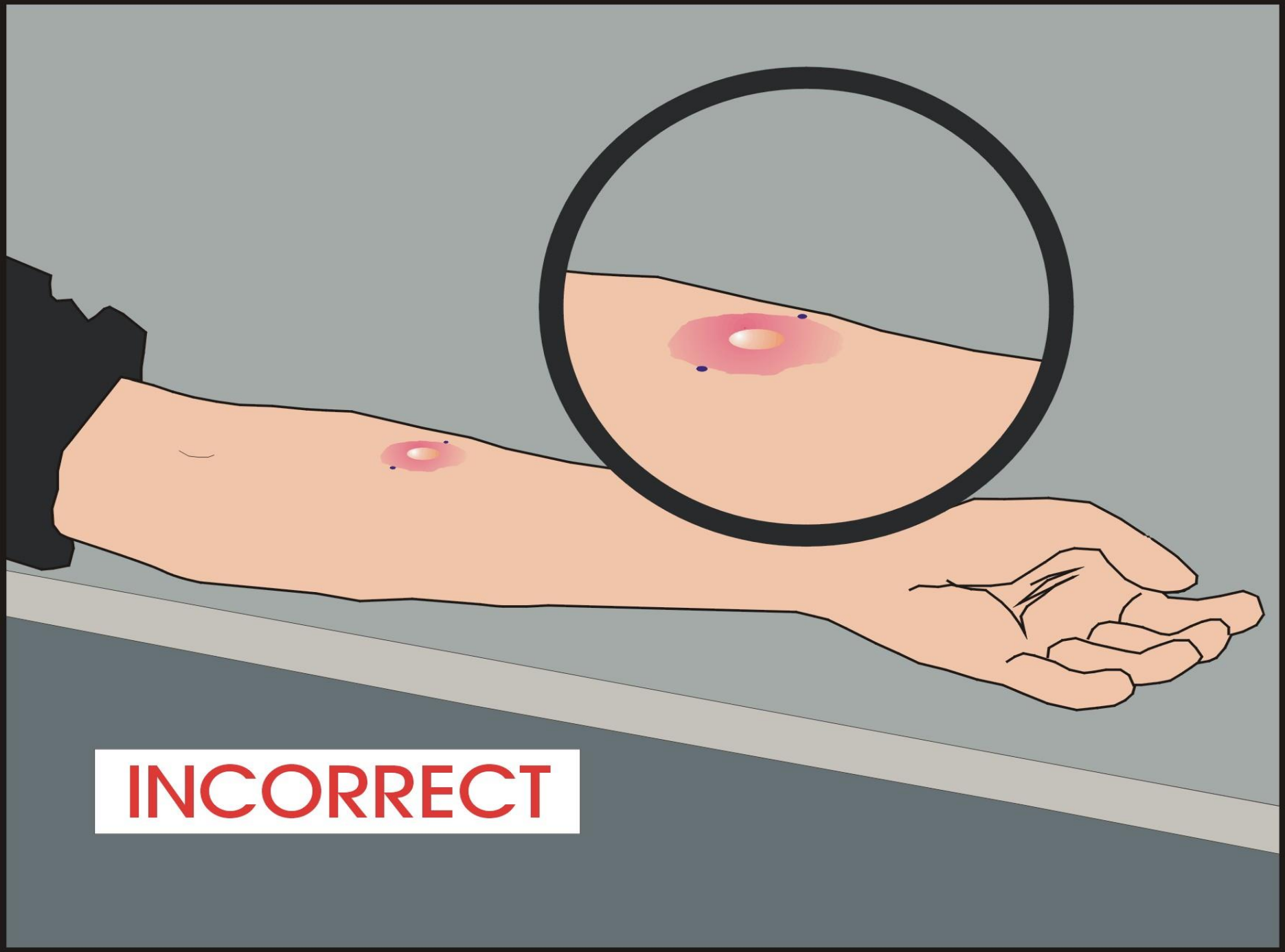
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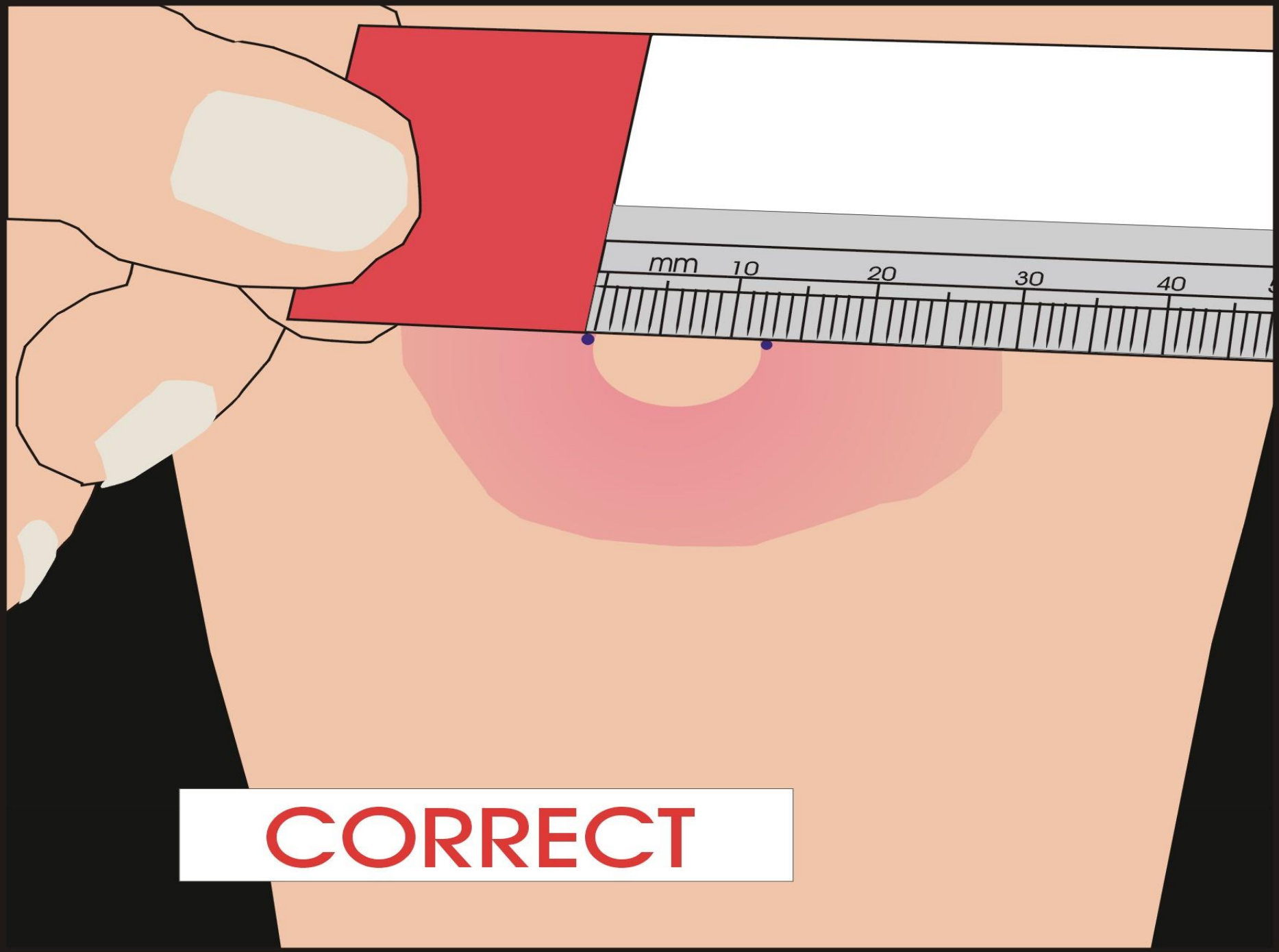
mm
10
20
30
40
CORRECT

TST: TUBERCULIN SKIN TESTING

Classifying the tuberculin reaction

- Consider size of reaction and client's risk factors
  - ≥ 5 mm is considered positive in
    - HIV-infected persons (known or suspected)
    - Close contacts of infectious TB cases
    - Fibrotic changes on CXR consistent with prior TB
      - Fibrotic lesions, not pleural thickening or isolated calcified granulomas
    - Clients with organ transplants and/or those receiving equivalent of 15 mg of prednisone daily for ≥ one month

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TST: TUBERCULIN SKIN TESTING

- ≥ 10 mm is considered positive in
  - Recent immigrants (within 5 years) from high prevalence countries
  - Injection drug users known to be HIV-negative
  - Residents and employees of high-risk congregate settings (e.g. hospitals, nursing homes, correctional facilities, homeless shelters)
  - Medically underserved, low-income populations (e.g. homeless persons)
  - Children 4 years of age and younger; children and adolescents exposed to adults at high risk
  - Persons with medical conditions that place them at increased risk of progression to TB disease

TST: TUBERCULIN SKIN TESTING

- ≥ 15 mm is considered positive in
  - Persons with no risk factors for TB
- Appropriate cutoff for persons with occupational exposure depends on
  - Individual risk factors for TB
  - Prevalence of TB in the facility
- Converter: an individual whose TST reaction has been documented to change from negative to positive (or increase by ≥ 10 mm) within the previous 2 years
- Reactor: an individual with a positive TST reaction

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FAQS ABOUT TST

Can infants be tested? – YES

Infants may not mount a DTH response to TST before 6 months of age, but should be tested if there is risk of exposure

Can pregnant women be tested? – YES

No evidence that TST has adverse effects on mother or fetus.

ACOG Guidelines emphasize that postponement of diagnosis of TB infection during pregnancy is unacceptable.

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FAQS ABOUT TST

Can a person with a previous positive TST be retested? YES

- Retesting is not necessary if the previous result can be documented
- Repeated skin tests do not sensitize or make persons “allergic” to tuberculin

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FALSE POSITIVE REACTIONS

- Infection with NTM
- Reader error; measuring erythema rather than induration
- Anergy; inability to react to the TST because of an impaired immune system
  - Severe illness
  - Immunosuppression (if CD4 < 200, 72% anergic)
  - Overwhelming TB (up to 50% of those with miliary disease are anergic)
  - Malnutrition
  - Age; infants and elderly
  - Live virus vaccinations; wait 4 - 6 weeks
    - MMR most common; also intranasal flu mist (not flu shot)

HEALTH EXAMINATION AND IMMUNIZATIONS FOR SCHOOL AGE CHILDREN

- In compliance with rules and regulations of the Department of Public Health
- All children in Illinois shall have a health examination
- A tuberculosis (TB) skin test screening shall be included as a required part of each health examination under this Section if the child resides in an area designated by the Department of Public Health as having a high incidence of TB (Joint Committee on Administrative Rules, Code 77:665.120)

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WHO NEEDS TO HAVE A TB TEST

There are no IDPH rules and regulations that require the initial or routine skin testing of school children for TB.

However, the local health department, TB Board or IDPH may after considering community factors; institute routine periodic testing when a community, school, or school district has a higher than expected prevalence of infection

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WHAT ABOUT TEACHERS & TB SCREENING?

State code requires all new employees to have a TB test

There is no subsequent requirement for TB test after the initial TB test

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RESEARCH AND PRACTICE:

1. Universal TB screening is contraindicated in low-risk populations.
2. Targeted screening of high-risk groups for TB skin test and treatment have been proven cost-effective and are recommended by the;
   - American Academy of Pediatrics
   - Advisory Committee for Elimination of Tuberculosis of the CDC,
   - American Thoracic Society

(Source: American Journal of Public Health, December 2002 vol.92, No.12., Public Health Impact of Targeted Tuberculosis Screening in Public Schools.)

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RESEARCH AND PRACTICE:

1. "It is not cost-effective to routinely skin test healthy children without risk for TB infection or disease.
2. Preferred strategy: "targeted testing" test only children more likely to be exposed to TB.
3. 3% to 25% of TB cases are identified by routine screening.
4. 26% to 80% of children with TB are identified during contact investigations.
5. 17% to 44% of TB cases identified because of symptoms". (http://www.nationaltbcenter.ucsf.edu/pediatric_tb/multimedia/player.html. Pediatric consultant Ann Loeffler MD, June 2010)

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LCHD TB PROGRAM RECOMMENDATIONS

1. Continue targeted TB screening and testing for school age students
2. Support IDPH and Illinois School Board TB guidelines
3. Continue surveillance of TB in school age children
4. Provide community physicians, physician assistants and advance nurse practitioners with relevant TB information that includes recommendation for targeted testing in school age children, description of high risk populations, article on TB in the pediatric population, Lake County statistics and a TB screening tool.

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TB RISK ASSESSMENT #1: REFER TO HANDOUT

Referral Exercise;

It is the second month of the new school year. A 14 year old comes to the nurse office with complaint of cough for three weeks. What do you do?

1.

2.

3.

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TB RISK ASSESSMENT: REFER TO HANDOUT

Referral Exercise;

It is the second month of the new school year. A 14 year old comes to the nurse office with complaint of cough for three weeks. What do you do?

1. Think: Cold, influenza, pertussis and TB
2. Initiate respiratory precautions and call parent to pick up child
3. Administer a TB risk assessment and provide parent with instructions as indicated

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TB RISK ASSESSMENT: REFER TO HANDOUT

TB risk assessment:

- Student has 3 week cough
- Vacationed in Mexico with parents
- Lost 5 pounds in 4 weeks
- Has been feeling tired

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TB RISK ASSESSMENT #2: REFER TO HANDOUT

TB risk assessment:

Student age 5

- Student has no cough
- Using prednisone for asthma
- Has been feeling tired
- Born in India,
- New student

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TB RISK ASSESSMENT #2: REFER TO HANDOUT

Student age 5 appearing and feeling tired all the time, born in India, new to school, no cough. What do you do?

1.

2.

3.

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TB RISK ASSESSMENT #2: REFER TO HANDOUT

Student age 5 appearing and feeling tired all the time, born in India, new to school, no cough. What do you do?

1. Review student record for medical examination required for new students
2. Determine if TB screening was indicated and administered. If no, you can perform TB risk assessment.
3. If TB risk assessment performed and referral not indicated then inform parent of child's condition and behavior for possible medical evaulation, non-TB related.
4. If TB risk assessment performed and TST is negative inform parent of child's condition and behavior for possible medical evaulation, could still be LTBI or early TB.

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PROPER PRECAUTIONS!

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QUESTIONS?

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Common Rashes in Children 2015

Dr. James Jupa

Infectious Disease Specialist

Lake County Health Department

Medical Advisor

LakeCounty
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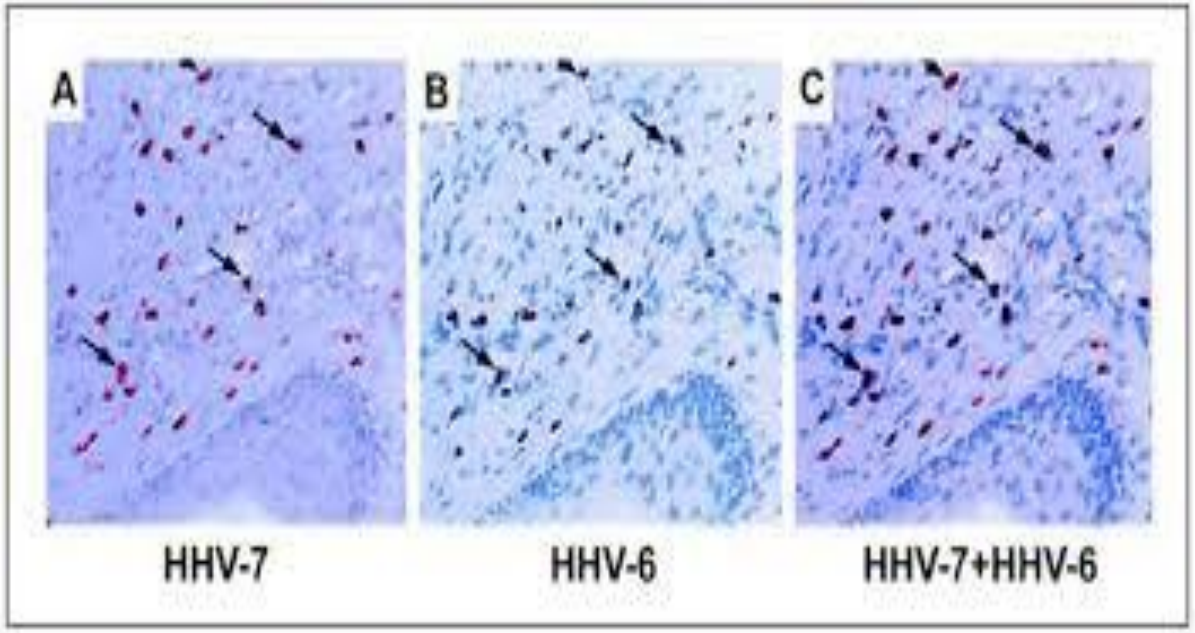
Human Herpes 6



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Roseola (Human Herpes 6)

- Roseola is a viral infection that commonly affects infants and children
- Other names: Exanthem subitum; Si
- First linked with Human Herpes 6 vir
- 2 variants of HHV-6 are A and B.

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HH6 Epidemiology

- U.S.: Serologic tests indicate that human herpesvirus 6 (HHV-6) infection is nearly universal
- International: International studies show some variation in worldwide seroprevalence
- Gender: Associated with female sex and having older siblings
- Age: 3 months to 4 years

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HH6

- Incubation period: 5 to 15 days
- Transmission: Saliva
- Symptoms:
  - High fever (as high as 105°F) lasting 3-7 days

  - About 2 to 4 days after becoming sick, the child's fever lowers and a rash appears
    - Starts on the middle of the body and spreads to the arms, legs, neck, and face.
    - Pink or rose-colored,
    - Has small sores that are slightly raised
    - The rash lasts from a few hours to 2 to 3 days. It usually does not itch

HH6

- Recurrences of roseola infantum are not common.
- Diagnostic tests:
  - Roseola infantum diagnosis may be confirmed by virus isolation, seroconversion (immunoglobulin M), or detection of viral DNA sequences in peripheral blood mononuclear cells.
  - Specific antibodies to differentiate human herpesvirus (HHV)–6A- and HHV-6B can be determined using a serological assay based on immunoblot analysis using recombinant HHV-6A p100 and HHV-6B 101K

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HH6

- Complications
- Aseptic meningitis (rare)
- Encephalitis (rare)
- Febrile seizure

- Treatment:
  - No antiviral treatment;
  - Supportive care with antipyretics

- Prevention: Handwashing

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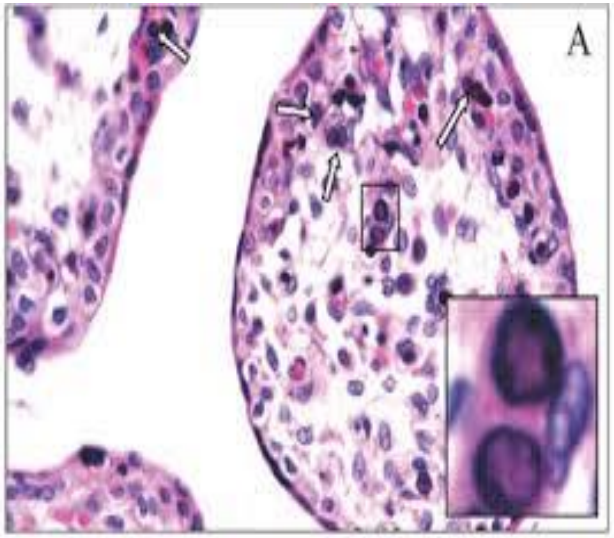
Parvovirus B19



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Parvovirus B19

- Fifths disease or erythema infectiosum is a viral infection caused by parvovirus B19.
- Parvovirus 19 only found in humans.
- Parvovirus B19 (B19V) is a single-stranded DNA virus of the family Parvoviridae and genus Erythrovirus.
- History: Causative agent discovered in 1975
- Fifth disease mostly affects children.

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Parvovirus B19 Epidemiology

- U.S.:
  - May be sporadic or may occur in outbreaks in the late winter through early spring.
  - A cyclic increase in the number of infections is also observed, peaking every 3-4 years.
- Gender: Affects males and females in equal numbers.
- Age: Common in school-aged and younger children who attend daycare facilities.
- International:
  - Parvovirus B19 infection is common worldwide.
  - The age distribution is similar to that observed in the United States.

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Parvovirus B19

- Incubation period: from infection to initial, nonspecific symptoms ranges from 4-14 days; as long as 21 days after exposure
- Transmission: Large droplet spread through saliva and mucus, vertical transmission (birth).
- Symptoms:
  - Fever (15-30%)
  - Malaise
  - Headache,
  - Myalgia,
  - Nausea
  - Rhinorrhea; typically beginning 5-7 days after initial infection

Parvovirus B19

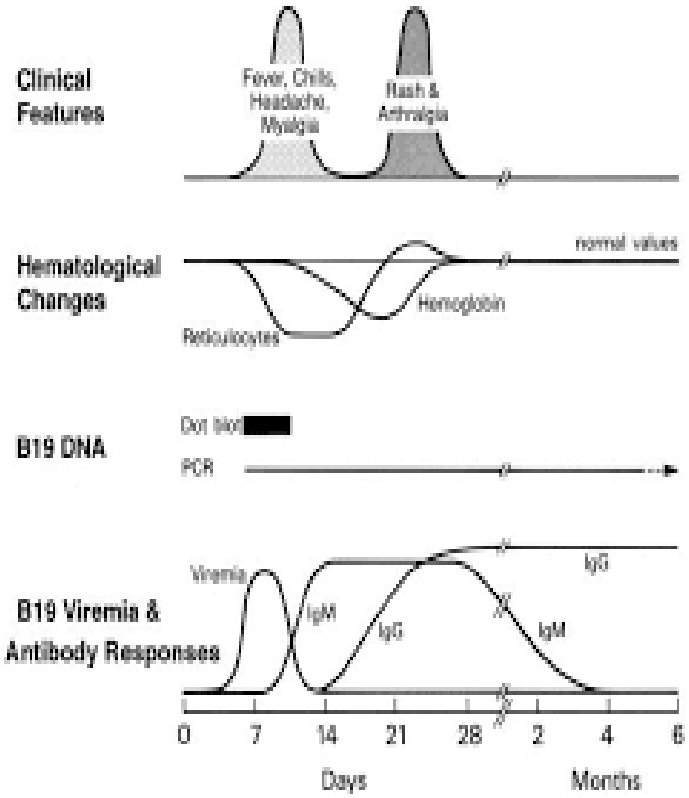
- Symptoms:
  - 1 week later a bright red macular exanthem appears on the cheeks and is often associated with circumoral pallor
  - A diffuse maculopapular rash can appear 1-4 days later and fades to a lacy erythematous rash,
  - Pruritic and may spread gradually toward the distal extremities. Painful pruritic papules and purpura may be present on the hands and feet as part of PPGSS.
  - Classic "slapped cheek" rash is much more common in young children.
  - Transient small joint arthropathy may be the main clinical presentation of parvovirus B19 in adults.

Parvovirus B19

- Complications:
  - Transient aplastic crisis (TAC)
  - Myocarditis, vasculitis, glomerulonephritis, or encephalitis
  - Pregnant women may result in hydrops fetalis, particularly when infection occurs before 20 weeks' gestation
  - Neurological manifestations
- Diagnostic tests: No use of diagnostic tests for immunocompetent primary infections. Fetal ultrasonography may be useful in detecting hydrops.

Parvovirus B19

B19 viremia and antibody responses



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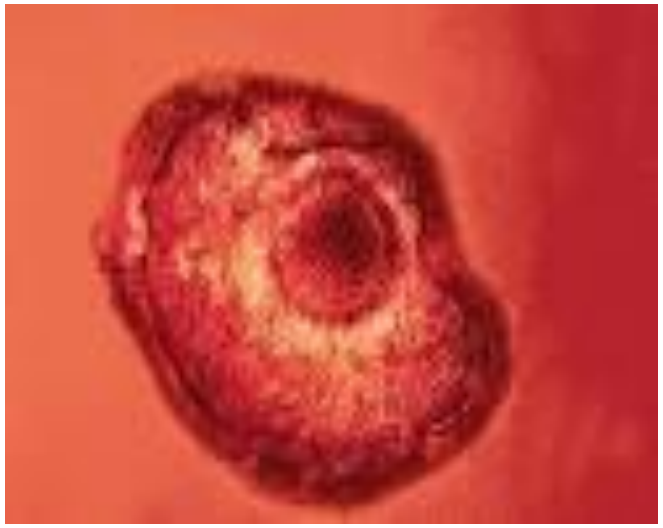
Parvovirus B19

- Treatment: Supportive, antipyretics
- Intravenous immunoglobulin (IVIG) has been used with good results for patients suffering pure red cell aplasia (PRCA). IVIG is not recommended for TAC
- TAC require packed RBC transfusions (80% in sickle cell disease)
- Although its use is controversial and carries many risks, intrauterine blood transfusions may be helpful in cases of hydrops fetalis

Parvovirus B19

- Patients with a resolved aplastic crisis or with a rash are no longer infectious.
- Patients are no longer infectious after other symptoms resolve (usually by day 7 of illness). Thus, patients with a classic parvovirus B19 rash may return to school or daycare.
- Prevention:
  - Handwashing
  - Exclusion from susceptible populations (blood dyscrasia, immunosuppression, pregnancy)

Chickenpox



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Varicella (Chickenpox)

- VZV is a DNA virus and is a member of the herpesvirus group
- VZV has the capacity to persist in the body after the primary (first) infection as a latent infection.
- VZV persists in sensory nerve ganglia and latent infection is shingles.
- Virus is believed to have a short survival time in the environment.

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Varicella:

- VZV enters through the respiratory tract and conjunctiva
- VZV replicates at the site of entry in the nasopharynx and in regional lymph nodes
- Virus can be cultured from mononuclear cells of an infected person from 5 days before to 1 or 2 days after the appearance of the rash.
- Multiple tissues, including sensory ganglia, infected during viremia

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Varicella: Epidemiology

- Distribution: World wide
- Reservoir: Humans
- Incubation period: 14-16 days (range 10-21 days)
- Transmission: Vesicular fluid and large droplet spread

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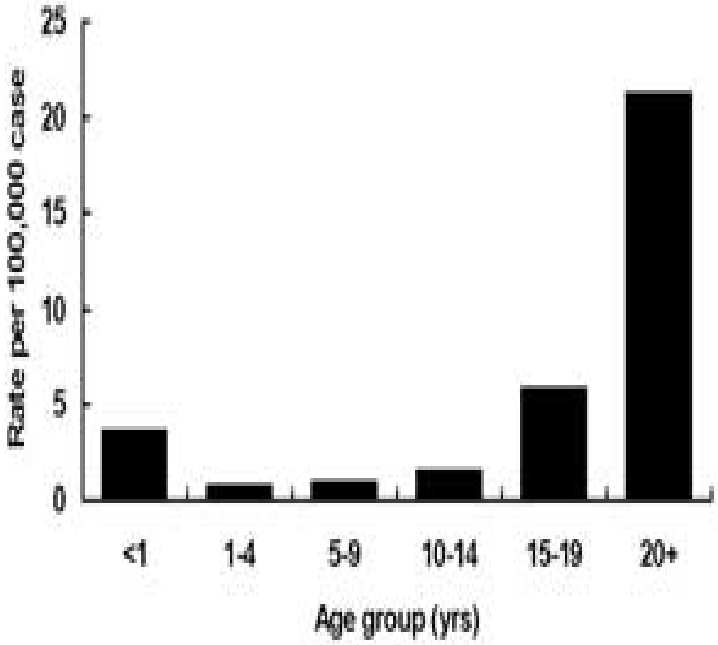
Varicella: Epidemiology



*Deaths per 100,000 cases. Meyer et al, *J Infect Dis* 2000;182:383-90

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Varicella: Symptoms

- Prodromal phase: Fever, Malaise

- Rash: The clinical course in healthy children is generally mild, malaise, pruritus (itching), and temperature up to 102° for 2 to 3 days. Adults may have more severe disease and have a higher incidence of complications.

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Varicella: Symptoms

- Reactivation of varicella zoster virus
- Associated with:
  - aging
  - immunosuppression
  - intrauterine exposure
  - varicella at younger than 18 months of age
- Unilateral distribution (Sensory nerve)

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Varicella: Laboratory

- Isolation of varicella virus from clinical specimen
- Rapid varicella virus identification using PCR (preferred, if available) or DFA
- Significant rise in varicella IgG by any standard serologic assay (e.g., enzyme immunoassay)

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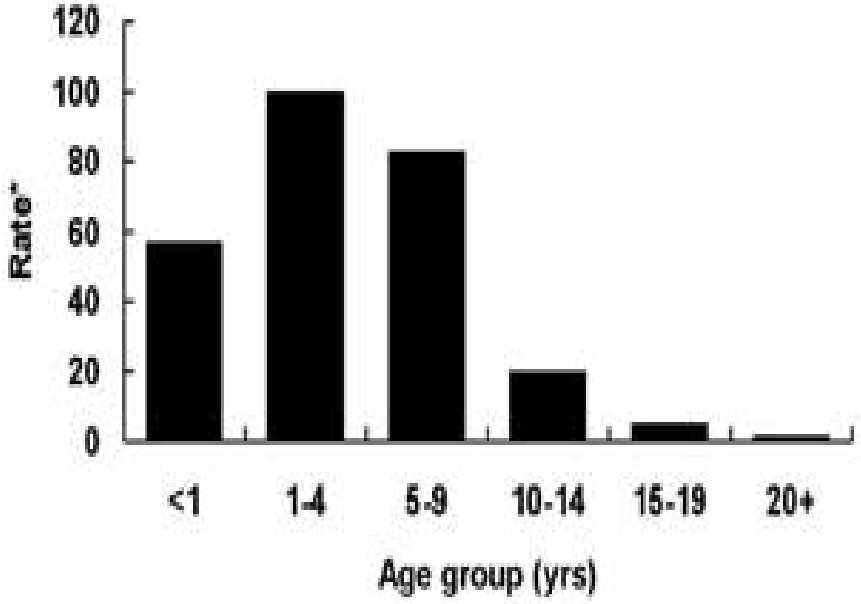
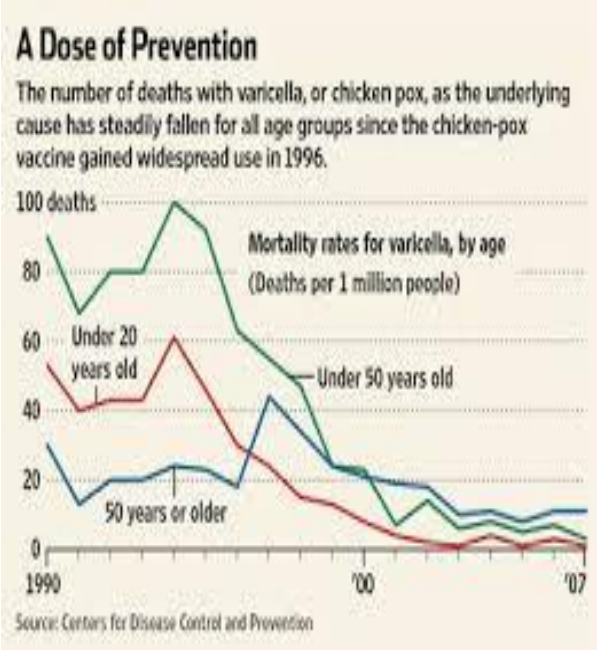
Varicella: Vaccine



*Rate per 100,000 population. National Health Interview Survey data



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Varicella: Vaccine

- Varicella vaccine (Varivax, Merck) is a live attenuated viral vaccine, derived from the Oka strain of VZV
- Vaccine virus was isolated by Takahashi in the early 1970s from vesicular fluid
- It was licensed in the United States in 1995 for persons 12 months of age and older.
- The vaccine is reconstituted with sterile water and contains no preservative.

Varicella: Vaccine

Varicella Vaccine Immunogenicity and Efficacy:

- Detectable antibody
  - 97% of children 12 months-12 years following 1 dose
  - 99% of persons 13 years and older after 2 doses
- 70%-90% effective against any varicella disease
- 95%-100% effective against severe varicella disease

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Varicella: Vaccine

Varicella Vaccine Recommendations Children:

- Routine vaccination at 12-15 months of age
- Routine second dose at 4-6 years of age
- Minimum interval between doses of varicella vaccine for children younger than 13 years of age is 3 months

Varicella Vaccine Recommendations Adolescents and Adults:

- All persons 13 years of age and older without evidence of varicella immunity
- Two doses separated by at least 4 weeks
- Do not repeat first dose because of extended interval between doses

Varicella: Post-exposure prophylaxis

- The patient groups recommended by ACIP to receive VariZIG include the following:

•Immunocompromised patients

•Neonates whose mothers have signs and symptoms of varicella around the time of delivery (i.e., 5 days before to 2 days after)

•Preterm infants born at 28 weeks gestation or later who are exposed during the neonatal period and whose mothers do not have evidence of immunity

•Preterm infants born earlier than 28 weeks' gestation or who weigh 1,000g or less at birth and were exposed during the neonatal period, regardless of maternal history of varicella disease or vaccination

•Pregnant women

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Rubella

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Rubella

- Other names: German measles or 3 day measles
- History: 1814 first distinguished as separate from variant measles or scarlett fever. 1914 was identified as viral etiology and in 1938 confirmed as virus.
- Member of the Rubivirus genus of the family Togaviridae.
- An enveloped RNA virus, with a single antigenic type that does not cross-react with other members of the togavirus group
- In 2004 found that about 91% of the US population is immune to rubella.

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Rubella Epidemiology

- U.S.:
  - 1962-1965: 1.2 million cases of rubella, 20,000 congenital rubella syndrome
  - Median of 11 cases annually in 2005-2011
- International: Endemic Worldwide. In 2010 PAHO announced region of the Americas achieved rubella and CRS elimination goal.
- Temperate areas: incidence is usually highest in late winter and early spring.
- Age: Since 2004 persons 20-49 years of age have accounted for 60 percent of the cases (median age 32 years).

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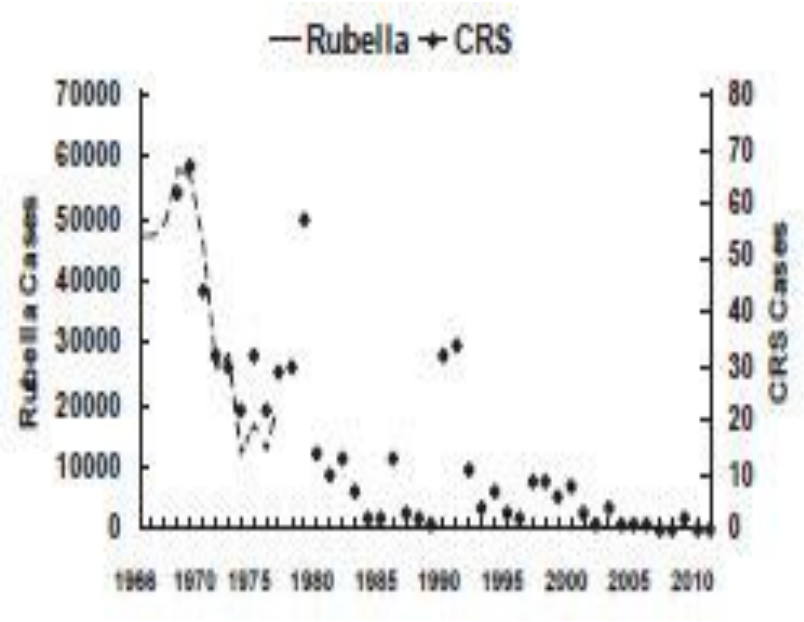
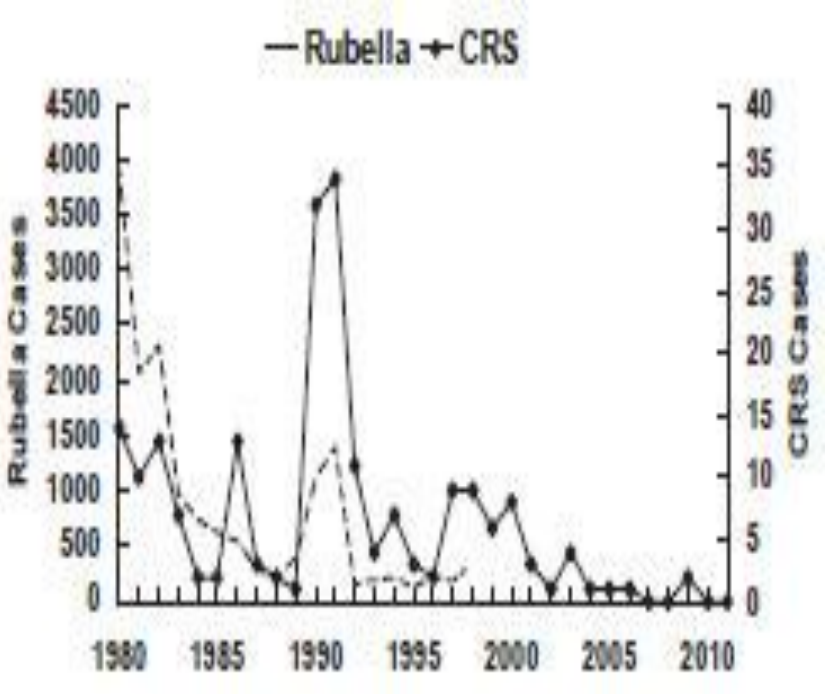
Rubella Epidemiology

Rubella — United States, 1966-2011



Rubella — United States, 1980-2011



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Rubella

- Incubation: The incubation period of rubella is 14 days, with a range of 12 to 23 days
- Transmission: Aerosolized particles from the respiratory tract secretions (large droplet), virus may be shed from 7 days before to 5-7 days or more after rash onset.
- Symptoms:
  - Low grade fever (<101.5°F)
  - Malaise
  - Lymphadenopathy
  - Upper respiratory symptoms
  - Rash (maculopapular)

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Rubella

- Complications:
  - Arthralgia or arthritis may occur in up to 70% of adult women who contract rubella
  - Encephalitis occurs in one in 6,000 cases, more frequently in adults (especially in females) than in children. Mortality estimates vary from 0 to 50%
  - Hemorrhagic manifestations occur in approximately one per 3,000 cases, occurring more often in children than in adults.
  - Orchitis, neuritis, and a rare late syndrome of progressive panencephalitis.
  - Congenital rubella syndrome: Infection with rubella virus is most severe in early gestation.

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Rubella

- Diagnostic studies:
  - Reliable evidence of acute rubella infection:
  - Positive viral culture for rubella or detection of rubella virus by polymerase chain reaction (PCR),
  - Presence of rubella-specific IgM antibody, or
  - Demonstration of a significant rise in IgG antibody from paired acute- and convalescent-phase sera. Serum should be collected as early as possible (within 7-10 days) after onset of illness, and again 14-21 days (minimum of 7) days later.

Rubella

- Treatment: Supportive treatment with antipyretics.
- Starch baths and antihistamines may be useful for adult patients with uncomplicated rubella and troublesome itching.
- Prevention:
  - Exclusion of cases from work/school
  - Vaccine (except for medically contraindicated) (2 MMR or MMRV)

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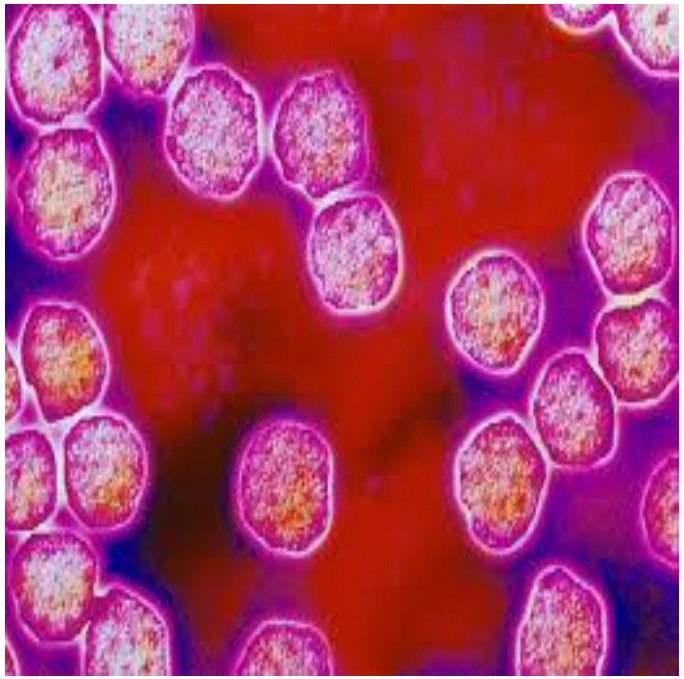
Rubeola



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Rubeola

- Other names: measles
- Early discussion of measles in 7th century, isolated virus in 1954
- The measles virus is a paramyxovirus, genus Morbillivirus. It is 120-250 nm in diameter, with a core of single-stranded RNA
- Disease was described by the Persian physician Rhazes in the 10th century as “more to be dreaded than smallpox

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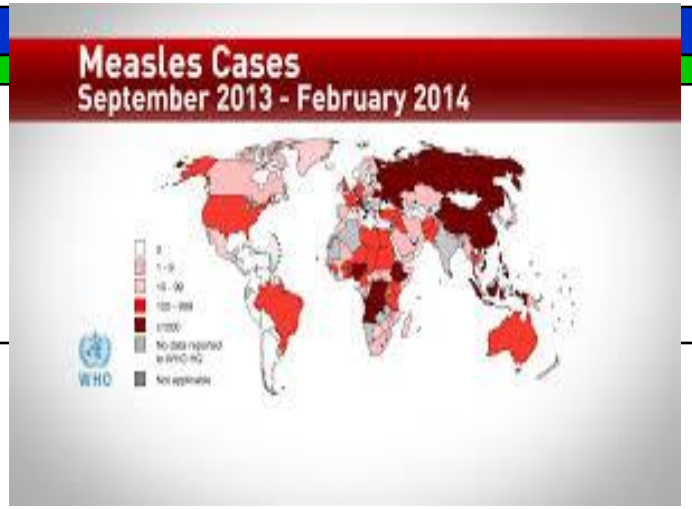
Rubeola



- Incubation: Exposure to prodrome, averages 10-12 days and to rash onset averages 14 days (range, 7-21 days)
- Transmission: primarily person to person via large respiratory droplets. Airborne transmission via aerosolized droplet nuclei has been documented in closed areas (e.g., office examination room) for up to 2 hours after occupancy. 4 days before to 4 days after rash onset.

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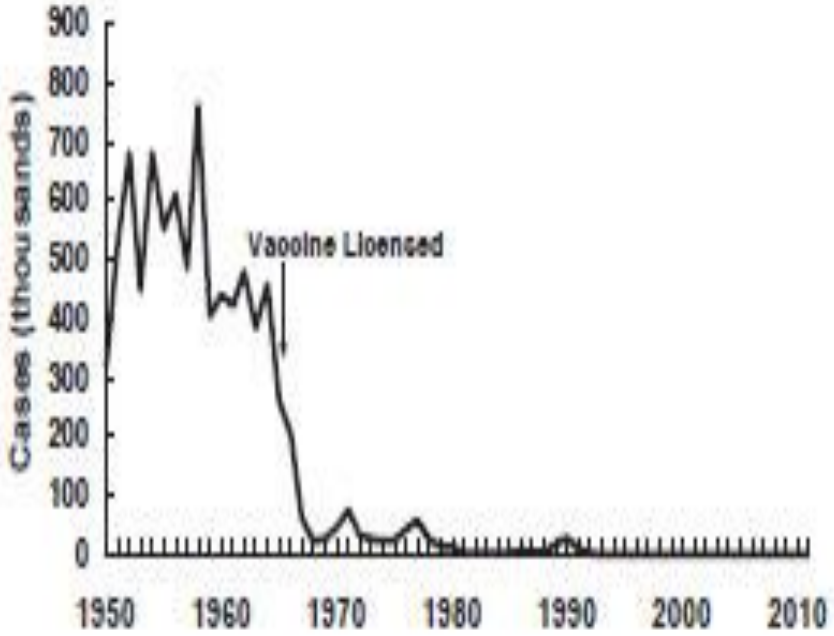
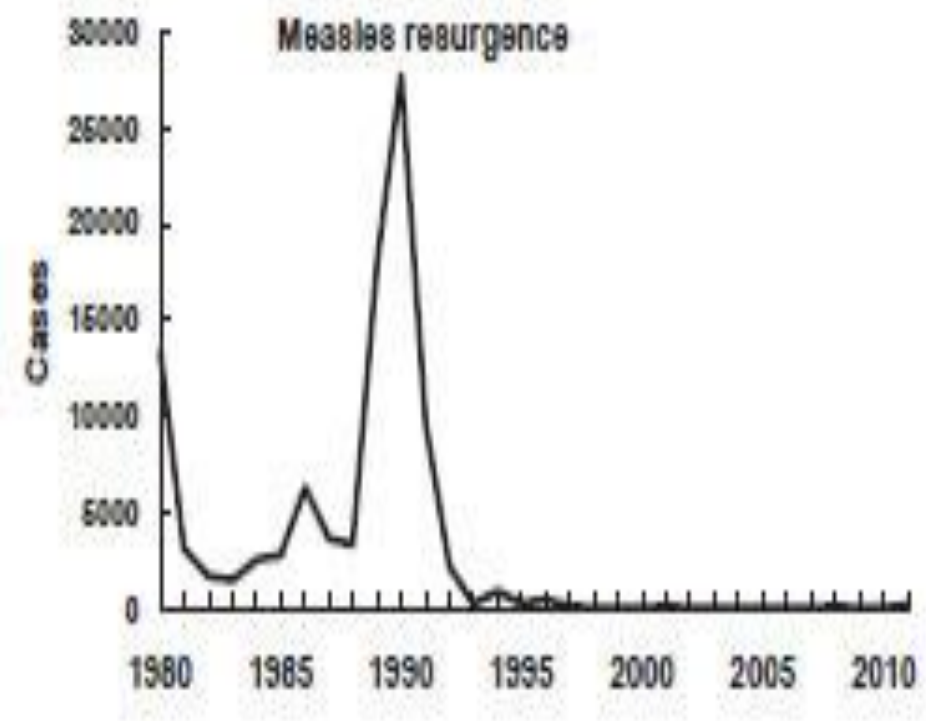
Rubeola Epidemiology

Measles - United States, 1950-2011



Measles - United States, 1980-2011



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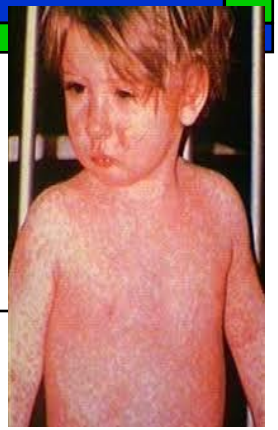
Rubeola



- Symptoms:
  - Prodrome 2-4 days stepwise increase in fever to 103°F-105°F
  - cough, coryza, conjunctivitis
  - Koplik spots (rash on mucous membranes)
- Rash 2-4 days after prodrome, 14 days after exposure
  - persists 5-6 days
  - begins on face and upper neck
  - maculopapular, becomes confluent
  - fades in order of appearance

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Rubeola

Complications

Diarrhea	8%
Otitis media	7%
Pneumonia	6%
Encephalitis	0.1%
Seizures	0.6-0.7%
Death	0.2%

Pregnancy
Immunocompromised
Malnourished

Based on 1985-1992 data

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Rubeola

- Diagnostic tests:
  - Isolation of measles virus from urine, nasopharynx, blood, throat, Throat swabs and nasal swabs can be sent on viral transport medium or a viral culturette swab to isolate the measles virus. Urine specimens can be sent in a sterile container for viral culture.
  - Significant rise in measles IgG by any standard serologic assay (e.g., EIA, HI)
  - Positive serologic test for measles IgM antibody, in the first 72 hours after rash onset, up to 20% of tests for IgM may give false-negative results
  - Reverse-transcription polymerase chain reaction (PCR) evaluation is highly sensitive at visualizing measles virus RNA

Rubeola

- Diagnostic tests:
- Chest radiography

  If bacterial pneumonia is suspected, perform chest radiography. The frequent occurrence of measles pneumonia, even in uncomplicated cases, limits the predictive value of chest radiography for bacterial bronchopneumonia.

- Lumbar puncture

  If encephalitis is suspected, perform a lumbar puncture. CSF examination reveals the following:

  - Increased protein
  - Normal glucose
  - Mild pleocytosis with a predominance of lymphocytes

Rubeola

- Treatment:
  - Supportive care is normally all that is required for patients with measles.
  - Secondary infections (eg, otitis media or bacterial pneumonia) should be treated with antibiotics;
  - Patients with severe complicating infections (eg, encephalomyelitis) should be admitted for observation and antibiotics, as appropriate to their clinical condition.
  - IV rehydration is required; patients may be markedly febrile and consequently may become dehydrated.
  - Fever management with standard antipyretics is appropriate.

Rubeola

- Prevention:
  - Exclusion from work/school
  - Handwashing
  - Use of facial tissues
  - Sneezing/cough etiquette
  - Isolation/hospitalization for complications
  - Proper nutrition
  - Vaccine (except medically contraindicated), MMR, MMRV x 2

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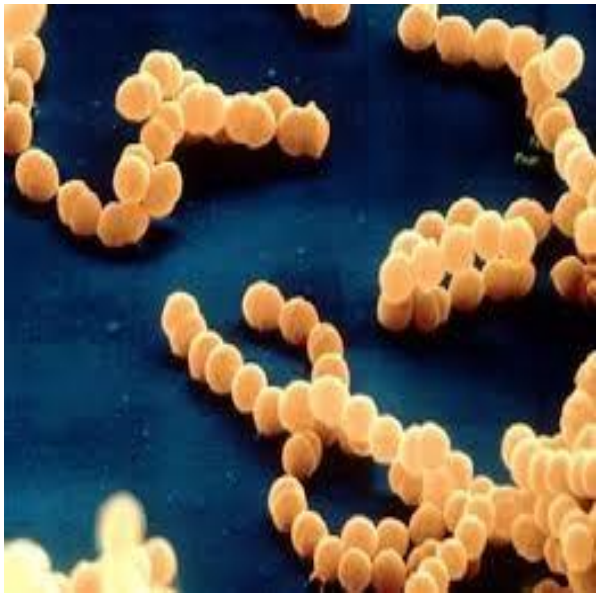
Scarlet Fever



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Scarlet Fever

- Other name: Scarlatina
- Bacterial infection caused by group A Streptococcus or "group A strep."
- Exotoxin-mediated streptococcal infections range from localized skin disorders (eg, bullous impetigo) to the widespread eruption of scarlet fever to the uncommon but highly lethal streptococcal toxic shock syndrome.
- Erythema producing toxin discovered in 1924

Scarlet Fever Epidemiology

- 10% of the population contracts group A streptococcal pharyngitis. Of this group, as many as 10% then develop scarlet fever.
- Infection rate increases in overcrowded situations (e.g., schools, institutional settings).
- Temporality: Incidence of pharyngeal disease is highest in school-aged children (5-15 y) during winter and spring.
- Age: Scarlet fever predominantly occurs in children aged 5-15 years, though it can also occur in older children and adults.

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Scarlet Fever

- Incubation: Ranges from 12 hours to 7 days. Patients are contagious during the acute illness and during the subclinical phase.
- Transmission: Person-to-person spread by means of respiratory droplets is the most common mode of transmission. It can rarely be spread through contaminated food. Is able to survive extremes of temperature and humidity, which allows spread by fomites.

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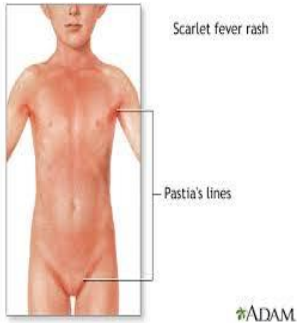
Scarlet Fever

- Symptoms:
- A very red, sore throat
- A fever (101° F or above)
- A red rash with a sandpaper feel
- Bright red skin in underarm, elbow and groin creases (Pastia's lines)
- A whitish coating on the tongue or back of the throat
- A "strawberry" tongue
- Headache
- Nausea or vomiting
- Abdominal pain
- Swollen glands
- Body aches



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Scarlet Fever

- Complications:
- Rheumatic fever (an inflammatory disease that can affect the heart, joints, skin, and brain)
- Kidney disease (inflammation of the kidneys, called post-streptococcal glomerulonephritis)
- Otitis media (ear infections)
- Skin infections
- Abscesses of the throat
- Pneumonia (lung infection)
- Arthritis (joint inflammation)

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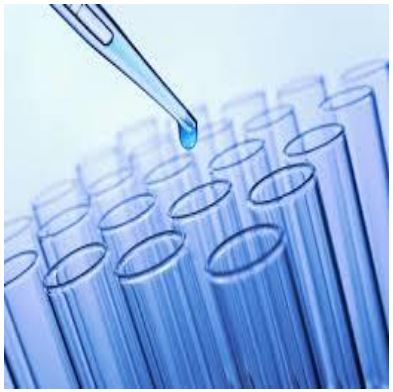
Scarlet Fever

- Diagnostic Tests:
  - Standard blood and urine tests
  - Throat culture or rapid streptococcal test
  - Anti-deoxyribonuclease B and antistreptolysin-O titers (antibodies to streptococcal extracellular products)



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Scarlet Fever

- Treatment:
  - Antibiotic therapy is the treatment of choice for scarlet fever.
  - Antipyretics, antihistamines
  - Exclusion from work/school until at least 24 hours after initiation of antibiotics and cessation of fever without antipyretics
- Prevention:
  - Wash your hands often
  - Avoid sharing eating utensils, items. linens, towels or other personal

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Questions‘

Did You Know...

- There are 49 germs per square inch on the toilet seat.
- There are 45,000 germs per square inch on your cell phone.

EWW. Gross. WASH YOUR HANDS.

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Maternal Child Health Programs – an Overview

Damaris Montano, RN, BSN, MPH

September 2015

LakeCounty
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Objectives

- List 3 Maternal Child Health Programs Offered by LCHD
- Identify Communities Where the Success By 6 Program is delivered
- List 3 Referral Criteria for MCH Programs

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Maternal Child Health Programs

- Family Case Management
- Nurse Family Partnership
- Health Works Lead Agency
- Childhood Lead Prevention Program
- Personal Responsibility Education Program
- Success By 6

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Family Case Management

- Case Management for Families with a Pregnant Woman or an Infant up to age one or age two if high risk
- Clients must be Medicaid or WIC eligible
- No income limits for APORS – high risk infants

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Nurse Family Partnership

- Intensive, evidence based nurse home visiting program
- First time low income women
- Enter program before 28th week of pregnancy
- Exit when infant is two years old

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Health Works of Illinois Lead Agency

- Medical Case Management of children in the custody of DCFS
- 0 – 21 years

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Childhood Lead Prevention Program

- Children 6 months to 7 years; pregnant women
- Blood Lead Level ≥10µ/dl
- Nurse Home Visit
- Environmental Home Inspection

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Personal Responsibility Education Program

- 6th – 12th Grade
- Peer Pressure
- Pregnancy Prevention
- STI and HIV Prevention
- Age and developmentally appropriate

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Success By 6

- Collaborative program between United Way, One Hope United and LCHD
- Waukegan, North Chicago and Zion Elementary School Districts
- Home Visiting for Kindergarten Preparedness

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Contact Us

- Referral Number:

  847-377-8050

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